

**Petition For Revival Of An Application For Patent Abandoned  
Unintentionally Under 37 CFR 1.137(b) (Large Entity)**

**COPY**

Docket No.  
55750 (45672)

In Re Application Of: **Takako ADACHI and Makoto SHIOMI**

Serial No.  
09/820,021

Filing Date  
28 March 2001

Examiner  
Zamani, Ali A.

Group Art Unit  
2674

Invention:

**LIQUID CRYSTAL DISPLAY DEVICE**

Attention: Office of Petitions  
COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

NOTE: If information or assistance is needed in completing this form, please contact Petitions Information at (703) 305-9282.

The above-identified application became abandoned for failure to file a timely and proper response to a notice or action by the Patent and Trademark Office. The date of abandonment is the day after the expiration date of the period set for reply in the Office notice or action plus any extension of time actually obtained.

**APPLICANT HEREBY PETITIONS FOR REVIVAL OF THIS APPLICATION**

NOTE: A grantable petition requires the following items:

- (1) Petition fee;
- (2) Reply and/or issue fee;
- (3) Terminal disclaimer with disclaimer fee--required for all utility and plant applications filed before June 8, 1995; and for all design applications; and
- (4) Statement that the entire delay was unintentional.

1. ☒ A proposed reply to the above-identified notice or action:

☒ is enclosed. ☐ was filed on \_\_\_\_\_

The proposed reply is in the form of: Continuation Application

2. ☐ The issue fee:

☐ is enclosed. ☐ was paid on \_\_\_\_\_

3. ☒ The abandoned application was a:

☐ design application. ☒ utility application. ☐ plant application.

4. ☐ A terminal disclaimer (and fee) disclaiming a period equivalent to the period of abandonment is enclosed.

5. ☒ Since this utility/plant application was filed on or after June 8, 1995, no terminal disclaimer is required.

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**28 March 2001**

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**Zamani, Ali A.**

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**2674**

Invention:

**LIQUID CRYSTAL DISPLAY DEVICE**

**Calculation and Payment of Fees**

Enclosed are the following fees:

- |   |                             |
|---|-----------------------------|
| 6. <input checked="" type="checkbox"/> Petition fee under 37 CFR 1.17(m) in the amount of:          | <u>\$1,300.00</u>           |
| 7. <input type="checkbox"/> Fee for amendment in the amount of:                                     | <u>                    </u> |
| 8. <input type="checkbox"/> Fee for extension of time to respond to Office Action in the amount of: | <u>                    </u> |
| 9. <input type="checkbox"/> Issue fee in the amount of:   | <u>                    </u> |
| 10. <input checked="" type="checkbox"/> Continuing application filing fee in the amount of:         | <u>\$750.00</u>             |
| 11. <input type="checkbox"/> Terminal disclaimer fee in the amount of:                              | <u>                    </u> |
| 12. <input type="checkbox"/> _____  | <u>                    </u> |
| Total fees enclosed: <u>\$2,050.00</u>  |                             |

The fee of **\$2,050** is to be paid as follows:

- ☒ A check in the amount of the fee is enclosed.
- ☒ The Director is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account No. **04-1105**

**Petition For Revival Of An Application For Patent Abandoned  
Unintentionally Under 37 CFR 1.137(b) (Large Entity)**

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Docket No.  
55750 (45672)

In Re Application Of: Takak ADACHI and Makoto SHIOMI

Serial No.  
09/820,021

Filing Date  
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Examiner  
Zamani, Ali A.

Group Art Unit  
2674

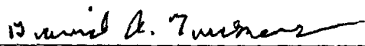
Invention:

**LIQUID CRYSTAL DISPLAY DEVICE**

**Statement**

The entire delay in filing the required reply from the due date for the required reply until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional.

In addition, please note the Supplemental Statement attached.

  
Signature

Dated: July 18, 2003

David A. Tucker  
Reg. No. 27,840  
Attorney for Applicant  
Edwards & Angell, LLP  
P.O. Box 9169  
Boston, MA 02209  
Telephone (617) 517-5508



21874

PATENT TRADEMARK OFFICE

CC:



COPY

Practitioner's Docket No. 55750 (45672)  
PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: T. Adachi, et al.  
Application No.: 09/820,021 Group No.: 2871  
Filed: March 28, 2001 Examiner: Unknown  
For: LIQUID CRYSTAL DISPLAY DEVICE

Mail Stop: NO FEE AMENDMENT  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

AMENDMENT TRANSMITTAL

1. Transmitted herewith is a Request for Reconsideration for this application.

STATUS

2. Applicant is  
[ ] a small entity. A statement:  
[ ] is attached.  
[ ] was already filed.  
[ X ] other than a small entity.

EXTENSION OF TERM

NOTE: "Extension of Time in Patent Cases (Supplement Amendments) -- If a timely and complete response has been filed after a

---

CERTIFICATE OF MAILING/TRANSMISSION (37 C.F.R. SECTION 1.8(a))

I hereby certify that, on the date shown below, this correspondence is being:

MAILING

- [ x ] deposited with the United States Postal Service  
with sufficient postage as first class mail in an  
envelope addressed to the Commissioner for  
Patents, P.O. Box 1450, Alexandria, VA 22313-  
1450.

FACSIMILE

- [ ] transmitted by facsimile to the Patent and  
Trademark Office (703) \_\_\_\_-\_\_\_\_.

Kathryn A. Grindrod  
Signature

Date: May 15, 2003

Kathryn A. Grindrod  
(type or print name of person certifying)

(Amendment Transmittal--page 1 of 4)

COPY

after expiration of the shortened statutory period.

*If a timely response has been filed after a Final Office Action, an extension of time is required to permit filing and/or entry of a Notice of Appeal or filing and/or entry of an additional amendment after expiration of the shortened statutory period unless the timely-filed response placed the application in condition for allowance. Of course, if a Notice of Appeal has been filed within the shortened statutory period, the period has ceased to run." Notice of December 10, 1985 (1061 O.G. 34-35).*

NOTE: See 37 C.F.R. Section 1.645 for extensions of time in interference proceedings, and 37 C.F.R. Section 1.550(c) for extensions of time in reexamination proceedings.

3. The proceedings herein are for a patent application and the provisions of 37 C.F.R. Section 1.136 apply.

*(complete (a) or (b), as applicable)*

- (a) ☐ Applicant petitions for an extension of time under 37 C.F.R. Section 1.136 (fees: 37 C.F.R. Section 1.17(a)(1)-(4)) for the total number of months checked below:

	Extension (months)	Fee for other than small entity	Fee for small entity
<input type="checkbox"/>	one month	\$ 110.00	\$ 55.00
<input type="checkbox"/>	two months	\$ 400.00	\$ 200.00
<input type="checkbox"/>	three months	\$ 920.00	\$ 460.00
<input type="checkbox"/>	four months	\$ 1,440.00	\$ 720.00

Fee: \$ \_\_\_\_\_

If an additional extension of time is required, please consider this a petition therefor.

*(check and complete the next item, if applicable)*

- ☐ An extension for \_\_\_\_\_ months has already been secured. The fee paid therefor of \$ \_\_\_\_\_ is deducted from the total fee due for the total months of extension now requested.

Extension fee due with this request \$ \_\_\_\_\_

OR

- (b) ☒ Applicant believes that no extension of term is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition for extension of time.

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FEE FOR CLAIMS

4. The fee for claims (37 C.F.R. Section 1.16(b)-(d)) has been calculated as shown below

(Col.1)	(Col. 2)	SMALL ENTITY			OR	OTHER THAN A SMALL ENTITY	
Claims Remaining After Amendment	Highest No. Previously Paid For	Present Extra	Rate	Addit. Fee		Rate	Addit. Fee
			\$9.00	\$		\$18.00	\$
	Independent Claims		\$42.00	\$		\$84.00	\$
	First Presentation of Multiple Dependent Claim+		\$140.00	\$		\$280.00	\$
						Total Addit. Fee	\$

\* If the entry in Col. 1 is less than the entry in Col. 2, write "O" in Col. 3,

\*\* If the "Highest No. Previously Paid For" IN THIS SPACE is less than 20, enter "20".

\*\*\* If the "Highest No. Previously Paid For" IN THIS SPACE is less than 3, enter "3".

The "Highest No. Previously Paid For" (Total or Indep.) is the highest number found in the appropriate box in Col. 1 of a prior amendment or the number of claims originally filed.

**WARNING:** "After final rejection or action (Section 1.113) amendments may be made canceling claims or complying with any requirement of form which has been made." 37 C.F.R. Section 1.116(a) (emphasis added).

(complete (c) or (d), as applicable)

(c) ☒ No additional fee for claims is required.

OR

(d) ☐ Total additional fee for claims required \$ \_\_\_\_\_.

FEE PAYMENT

5. ☐ Attached is a check in the sum of \$ \_\_\_\_\_.
- ☐ Charge Account No. \_\_\_\_\_ the sum of \$ \_\_\_\_\_.
- A duplicate of this transmittal is attached.

COPY

**FEE DEFICIENCY**

*NOTE: If there is a fee deficiency and there is no authorization to charge an account, additional fees are necessary to cover the additional time consumed in making up the original deficiency. If the maximum, six-month period has expired before the deficiency is noted and corrected, the application is held abandoned. In those instances where authorization to charge is included, processing delays are encountered in returning the papers to the PTO Finance Branch in order to apply these charges prior to action on the cases. Authorization to charge the deposit account for any fee deficiency should be checked. See the Notice of April 7, 1986, (1065 O.G. 31-33).*

6. [ X ] If any additional extension and/or fee is required, charge Account No. 04-1105.

**AND/OR**

[ X ] If any additional fee for claims is required, charge Account No. 04-1105.

David A. Tucker  
SIGNATURE OF PRACTITIONER

Reg. No. 27,840

David A. Tucker  
(type or print name of practitioner)  
Attorney for Applicant

Tel. No. (617) 517-5508

Edwards & Angell, LLP  
P.O. Box 9169  
P.O. Address

Customer No. 21874

Boston, MA 02209

335574

**IN THE CLAIMS:**

**Please amend Claims so as to read as follows:**

1. (As originally filed) A liquid crystal display device, comprising:  
a liquid crystal panel including a liquid crystal layer and an electrode for  
applying a voltage to the liquid crystal layer; and  
a driving circuit for supplying a driving voltage to the liquid crystal panel,  
wherein  
the liquid crystal panel exhibits, in its voltage-transmittance  
characteristics, an extreme transmittance at a voltage equal to or  
lower than a lowest gray-level voltage, and  
the driving circuit supplies to the liquid crystal panel a predetermined  
driving voltage overshooting a gray-level voltage corresponding to  
an input image signal of a current vertical period, according to a  
combination of an input image signal of an immediately preceding  
vertical period and the input image signal of the current vertical  
period.
2. (As originally filed) The liquid crystal display device according to claim 1,  
wherein a difference in retardation of the liquid crystal panel between a  
state where a voltage is not applied and a state where a highest gray-level  
voltage is applied is 300 nm or more.



3. (As originally filed) The liquid crystal display device according to claim 1, wherein the liquid crystal panel is a transmission-type liquid crystal panel, and the extreme transmittance provides a maximum transmittance.
4. (As originally filed) The liquid crystal display device according to claim 1, wherein a single vertical period of the input image signal corresponds to a single frame, at least two fields of the driving voltage correspond to a single frame of the input image signal, and the driving circuit supplies, at least in a first field of the driving voltage, a driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current field to the liquid crystal panel.
5. (As originally filed) The liquid crystal display device according to claim 1, wherein the liquid crystal layer is a homogeneous-orientation liquid crystal layer.
6. (As originally filed) The liquid crystal display device according to claim 1, wherein the liquid crystal panel further includes a phase compensator, three principal refractive indices  $n_a$ ,  $n_b$  and  $n_c$  of an index ellipsoid of the phase compensator have a relation of  $n_a = n_b > n_c$ , and the phase compensator is arranged so as to cancel at least a part of retardation of the liquid crystal layer.

7. (As originally filed) A liquid crystal display device, comprising:
- a liquid crystal panel including a plurality of picture-element capacitors arranged in a matrix, and thin film transistors respectively electrically connected to the plurality of picture-element capacitors; and
  - a driving circuit for supplying a driving voltage to the liquid crystal panel, wherein
- the liquid crystal display device updates display every vertical period by rendering the plurality of picture-element capacitors in a charged state corresponding to the input image signal,
- each of the plurality of picture-element capacitors includes a liquid crystal capacitor formed from a corresponding picture-element electrode, a counter electrode and a liquid crystal layer provided between the picture-element electrode and the counter electrode, and
- a storage capacitor electrically connected in parallel with the liquid crystal capacitor, a capacitance ratio of the storage capacitor to the liquid crystal capacitor being 1 or more, and
- the picture-element capacitor retains 90% or more of a charging voltage over a single vertical period, when at least a highest gray-level voltage is applied.
8. (As originally filed) The liquid crystal display device according to claim 7,
- wherein the driving circuit supplies to the liquid crystal panel a predetermined driving voltage overshooting a gray-level voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately preceding vertical period and the input image signal of the current vertical period.

9. (As originally filed) The liquid crystal display device according to claim 8, wherein, for the input image signal of every gray level, the driving circuit supplies to the liquid crystal panel the driving voltage overshooting the gray-level voltage corresponding to the input image signal of the current vertical period.
10. (As originally filed) The liquid crystal display device according to claim 7, wherein the liquid crystal layer of the liquid crystal panel includes a nematic liquid crystal material having a positive dielectric anisotropy, the liquid crystal layer included in each of the plurality of picture-element capacitors includes first and second regions having different orientation directions, and the liquid crystal panel further includes a pair of polarizers arranged so as to orthogonally cross each other with the liquid crystal layer interposed therebetween, and a phase compensator for compensating for a refractive index anisotropy of the liquid crystal layer in a black display state.
11. (As originally filed) The liquid crystal display device according to claim 7, wherein the liquid crystal layer is a homogeneous-orientation liquid crystal layer.
12. (As originally filed) The liquid crystal display device according to claim 11, wherein the liquid crystal panel further includes a phase compensator, three principal refractive indices  $n_a$ ,  $n_b$  and  $n_c$  of an index ellipsoid of the phase compensator have a relation of  $n_a = n_b > n_c$ , and the phase compensator is arranged so as to cancel at least a part of retardation of the liquid crystal layer.

13. (New Claim) A liquid crystal display device, in which a driving circuit applies a driving voltage to a liquid crystal panel to control the transmittance of the liquid crystal panel for display, wherein:

the liquid crystal panel exhibits, in its voltage-transmittance characteristics, a maximum or minimum transmittance at a voltage lower than a lowest gray-level voltage; and  
the driving circuit selectively supplies to the liquid crystal panel as a predetermined driving voltage corresponding to an input image signal of a current vertical period, according to a combination of an input image signal of an immediately preceding vertical period and an input image signal of the current vertical period, at least a gray-level voltage which falls within a range between the lowest gray-level voltage and the highest gray-level voltage, and an overshoot gray-level voltage which is lower than the lowest gray-level voltage.

14. (New Claim) A liquid crystal display device according to claim 13, wherein:

the liquid crystal panel is a normally white mode liquid crystal panel.

15. (New Claim) A liquid crystal display device according to claim 14, wherein

the driving circuit selectively applies the gray-level voltage which falls within a range between the lowest gray-level voltage and the highest gray-level voltage, the overshoot voltage which is lower than the lowest gray-level voltage, and an overshoot gray-level voltage which is higher than the highest gray-level voltage.

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16. (New Claim) A liquid crystal display device according to claim 13, wherein:  
the liquid crystal panel is a normally black mode liquid  
crystal panel.
17. (New Claim) A liquid crystal display device according to claim 16, wherein  
the driving circuit selectively applies the gray-level voltage which  
falls within a range between the lowest gray-level voltage and the  
highest gray-level voltage, the overshoot voltage which is lower  
than the lowest gray-level voltage, and an overshoot gray-level  
voltage which is higher than the highest gray-level voltage.

**REMARKS**

This Preliminary Amendment is being filed for the purpose of adding Claims 13 – 17 prior to the initial substantive examination of this application.

All of the claims that will be pending in this application upon the entry of the foregoing Amendment are set forth above as required by the Rules.

Applicants respectfully submit that New Claims 13 - 17 do not add any new matter to this application. Further, the entry of New Claims 13 – 17 will provide what Applicants respectfully submit is a more clear, complete and appropriate range of coverage of the subject matter that Applicants regard as their invention.

Applicants respectfully submit that Claims 1 - 17 of this application, as they will stand upon the entry of the foregoing Amendment, are in condition for allowance. Entry of the foregoing Amendment, early consideration of this application and allowance of this application in response to this communication, therefore, are respectfully requested.

COPY

Applicants also believe that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

Date: May 15, 2003

By: David A. Tucker

David A. Tucker  
Reg. No. 27,840  
Attorney for Applicant(s)

EDWARDS & ANGELL, LLP  
P.O. Box 9169  
Boston, Massachusetts 02209  
(617-517-5508)



**COPY**

Attorney's Docket No. 55750 (45672)  
**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: Takako Adachi, et al.  
Application No.: 09/820,021                      Group: 2674  
Filed: March 28, 2001                      Examiner: Zamani, Ali A.  
  
For: LIQUID CRYSTAL DISPLAY DEVICE

Mail Stop: office of Petitions  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

**CERTIFICATE OF EXPRESS MAILING UNDER 37 C.F.R. 1.10**

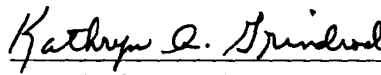
I hereby certify that the following correspondence:

Petition For Revival Of An Application For Patent Abandoned Unintentionally Under 37 CFR 1.137(b)  
including its attachments

Is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service  
under 37 CFR 1.10 (Express Mail Label No. EV 343733545 US), and is addressed to:

Mail Stop: Office of Petitions  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

on July 18, 2003

  
Kathryn A. Grindrod

342021



**21874**

PATENT TRADEMARK OFFICE



COPY

Attorney Docket No. 55,750 (45672)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT(S): T. Adachi, et al EXAMINER: Zamani, Ali A.  
SERIAL NO.: 09/820,021 GROUP: 2674  
FILED: 28 March 2001  
FOR: LIQUID CRYSTAL DISPLAY DEVICE

\*\*\*\*\*

**CERTIFICATE OF EXPRESS MAILING**

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service as Express Mail, Post Office to Address Service, Express Mail Label No. **EV343733545US** under 37 CFR 1.10 in an envelope addressed to Mail Stop: Office of Petitions, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on 18 July 2003.

By: Kathryn A. Grindrod  
Kathryn A. Grindrod

\*\*\*\*\*

Mail Stop: Office of Petitions  
COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**SUPPLEMENTAL STATEMENT IN SUPPORT OF PETITION FOR  
REVIVAL OF ABANDONED APPLICATION UNDER 37 CFR 1.137(b)**

In further support of the Petition to Revive the above-identified application under 37 CFR 1.137(b) the undersigned attorney for Applicants states as follows:

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The Notice of Abandonment in the above-identified application was issued by the United States Patent Office on 18 June 2003 on the basis that Applicants failed to respond to an Official Action dated 20 November 2002 prior to the statutory due date for the filing of such a response (i.e., 20 May 2003).

Applicants and Applicants' attorney's failure to file a timely response to the Official Action dated 20 November 2002 was unintentional throughout the entire statutory period for response.

More particularly, Applicants' attorneys, who were designated to receive correspondence from the United States Patent and Trademark Office in connection with the above-identified application, have to date not received a copy of the Official Action dated 20 November 2002 in the above-identified case. Further, Applicants' attorneys did not become aware of the existence of the Official Action of 20 November 2002 in the above-identified case until on or about 10 June 2003 in connection with the citation of the publication of this application against another application being prosecuted by this office.

At the time the Official Action of 20 November 2002 was issued, Applicants' attorney's address had changed from 130 Water Street, Boston, MA as designated in the originally filed application papers to P.O. Box 9169, 101 Federal Street, Boston, MA, and no formal change of address had yet been filed in this application. Nevertheless, as of 20 November 2002, Applicants' attorneys had in place an agreement with the United States Postal Service under which all mail addressed to their prior address was to be delivered to them at their new address. Applicants' attorneys consistently received mail directed to them by the United States Patent and Trademark Office at their former address at their new address until at least the end of December 2002, but the Official Action dated 20 November 2002 in this case was never so received.

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On 5 December 2002, Applicants' attorneys submitted to the United States Patent and Trademark Office a spreadsheet including some 24 pages detailing the patent applications and issued patents that they desired to be associated with their customer number, 21874 (see copy attached). The above-identified application is listed on page 23 of that spreadsheet as the 10<sup>th</sup> item from the top. This submission is believed to have been sufficient as a formal change of address in all of the listed cases.

Accordingly, it is respectfully submitted that Applicants' attorneys acted reasonably and properly to assure that all mail directed to them by the United States Patent and Trademark Office would either be forwarded to them by the United States Postal Service or correctly addressed by virtue of the notification document attached hereto.

Still further, attention is respectfully directed to the fact that Applicants filed a Preliminary Amendment in the above-identified case on 15 May 2003 and filed a Status Inquiry in the above-identified case on 28 May 2003. It is respectfully submitted that these filings were inconsistent with any receipt of the Official Action of 20 November 2002 in the above-identified case, and support Applicants' attorneys' statements to the effect that the Official Action of 20 November 2002 was never received. (See copies attached as part of the continuation application filed concurrently herewith)

Finally, Applicants' attorneys wish to acknowledge a series of telephone interviews conducted with the Examiner in early June of 2003 concerning the status of this application. During these interviews, Applicants' attorneys attempted to secure the re-issuance of the Official Action of 20 November 2002 by the Examiner based upon the fact that it had never been received. The result of these interviews, however, was that the Examiner after consultation with his supervisor refused Applicants' attorneys' request and indicated that a Notice of Abandonment would be issued in due course from which Applicants could petition for revival.

It is respectfully submitted that the foregoing circumstances clearly establish the fact that the failure to respond to the Official Action of 20 November 2002 in this application was unintentional for the entire statutory period for response and that Applicants by the filing of the attached Petition and Continuation Application have acted diligently to correct to unintended basis for the presently outstanding holding of abandonment.

Revival of this application at least for the purpose of allowing the filing of the attached continuation application during the pendency of the above-identified application is therefore respectfully requested.

COPY

Applicants also believe that additional fees beyond those submitted herewith are not required in connection with the consideration of this submission. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

Date: July 18, 2003

By: David A. Tucker

David A. Tucker  
Reg. No. 27,840  
Attorney for Applicant(s)

EDWARDS & ANGELL, LLP  
P.O. Box 9169  
Boston, Massachusetts 02209  
(617-517-5508)  
341954



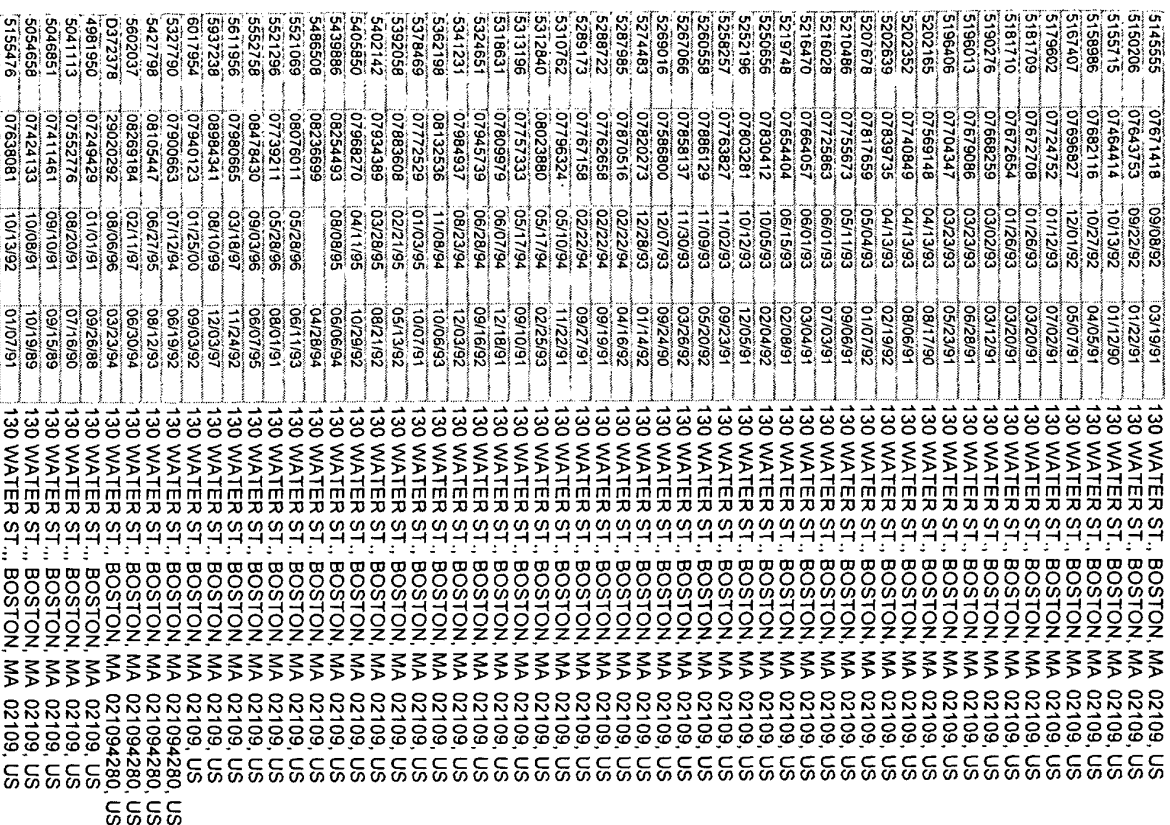
21874

PATENT TRADEMARK OFFICE

00021874

Edwards & Angell, LLP  
P.O. Box 9169  
Boston, MA 02209-4180

[illegible]



ROBERT M. NSHER, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN, ATTN: DAVID G. CONLIN, DIKE, BRONSTEIN,	Yes	Yes	Yes
ROBERT F. O'CONNELL, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN ET AL.	Yes	Yes	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN ET AL.	Yes	Yes	Yes
DIKE, BRONSTEIN, ROBERTS & CUSHMAN, DAVID ATTN: DONALD BROWN, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes	Yes	Yes
ROBERT L. GOLDBERG, DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & PETER J. MANUS, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DAVID G. COLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DONALD BROWN, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. COLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS AND DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & GEORE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & PETER J. MANUS, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & LINDA M. BUCKLEY, DIKE, BRONSTEIN, ROBERTS & ERNEST V. LINEK, DIKE, BRONSTEIN, ROBERTS & DIKE, BRONSTEIN, ROBERTS, CUSHMAN & PFUND	Yes	Yes	Yes
DONALD BROWN, ESQ., DIKE, BRONSTEIN, ROBERT F. O'CONNELL, ESQ., DIKE, BRONSTEIN,	Yes	Yes	Yes
HENRY D. PAHL, JR., DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes	Yes

5182195	072691	012653	110948	130 WATER ST., BOSTON, MA 02109, US
5209734	0756455	061193	091630	130 WATER ST., BOSTON, MA 02109, US
5327527	07821221	0705954	071692	130 WATER ST., BOSTON, MA 02109, US
4704088	06815373	110387	123185	130 WATER STREET, PFUND, BOSTON, MA 02109, US
10219245			081502	130 Water Street, Boston, MA 02109-4280, US
5215678	07808070	060193	121091	130 WATER STREET, BOSTMA, MA 02109, US
	10685610		0662001	130 Water Street, Boston, MA 02019, US
	10041058		1110101	130 Water Street, Boston, MA 02103, US
0431733	29090667	101000	0711498	130 WATER STREET, BOSTON, MA 02109, US
4822348	07049613	041839	041839	130 WATER STREET, BOSTON, MA 02109, US
4839458	07063001	0611869	0611787	130 WATER STREET, BOSTON, MA 02109, US
4847052	07031439	0711189	032687	130 WATER STREET, BOSTON, MA 02109, US
4876331	07230461	1024989	0810788	130 WATER STREET, BOSTON, MA 02109, US
4903125	07134714	0220290	121667	130 WATER STREET, BOSTON, MA 02109, US
4917670	07171895	0411790	032288	130 WATER STREET, BOSTON, MA 02109, US
49171774	06853560	0411790	042486	130 WATER STREET, BOSTON, MA 02109, US
4925710	07175975	0515190	0323168	130 WATER STREET, BOSTON, MA 02109, US
4935754	07141689	0662690	1230687	130 WATER STREET, BOSTON, MA 02109, US
4942883	07102540	072490	0929187	130 WATER STREET, BOSTON, MA 02109, US
4947187	07298840	080790	071839	130 WATER STREET, BOSTON, MA 02109, US
4952286	07153366	0828290	020868	130 WATER STREET, BOSTON, MA 02109, US
4960666	07449283	1002290	120586	130 WATER STREET, BOSTON, MA 02109, US
4968162	07363459	1106590	060689	130 WATER STREET, BOSTON, MA 02109, US
4973442	07098710	1127190	0927187	130 WATER STREET, BOSTON, MA 02109, US
4983462	07203043	0108951	060668	130 WATER STREET, BOSTON, MA 02109, US
4991155	07495991	020591	031950	130 WATER STREET, BOSTON, MA 02109, US
4994235	0731562	021991	1103369	130 WATER STREET, BOSTON, MA 02109, US
5000217	07365780	0328691	0562289	130 WATER STREET, BOSTON, MA 02109, US
5004525	07438020	0402291	112086	130 WATER STREET, BOSTON, MA 02109, US
5007990	07153357	0416591	020888	130 WATER STREET, BOSTON, MA 02109, US
5008266	07401612	0416591	082868	130 WATER STREET, BOSTON, MA 02109, US
5008769	07664222	0416591	011260	130 WATER STREET, BOSTON, MA 02109, US
5011834	07337858	043091	041189	130 WATER STREET, BOSTON, MA 02109, US
5012953	07420806	050791	112189	130 WATER STREET, BOSTON, MA 02109, US
5017105	07501147	052191	082058	130 WATER STREET, BOSTON, MA 02109, US
5017577	07383247	052191	071969	130 WATER STREET, BOSTON, MA 02109, US
5017742	07435348	052191	111369	130 WATER STREET, BOSTON, MA 02109, US
5025261	07464141	0618951	011650	130 WATER STREET, BOSTON, MA 02109, US
5028609	07361019	062591	060289	130 WATER STREET, BOSTON, MA 02109, US
5028854	07181210	070291	041368	130 WATER STREET, BOSTON, MA 02109, US
5028868	07421453	070291	101369	130 WATER STREET, BOSTON, MA 02109, US
5039689	07433484	081391	110839	130 WATER STREET, BOSTON, MA 02109, US
5040765	07425123	082091	051790	130 WATER STREET, BOSTON, MA 02109, US
5042828	07406055	082191	090569	130 WATER STREET, BOSTON, MA 02109, US
5042982	07382073	082191	0920189	130 WATER STREET, BOSTON, MA 02109, US
5045356	07434545	090391	110989	130 WATER STREET, BOSTON, MA 02109, US
5046647	07571032	0910391	0862290	130 WATER STREET, BOSTON, MA 02109, US
5049491	07122865	0911791	111967	130 WATER STREET, BOSTON, MA 02109, US
5049671	07455538	0917191	122289	130 WATER STREET, BOSTON, MA 02109, US
5049848	07442154	0917191	112969	130 WATER STREET, BOSTON, MA 02109, US
5051154	07471381	092491	012950	130 WATER STREET, BOSTON, MA 02109, US
5053418	07449485	100191	121189	130 WATER STREET, BOSTON, MA 02109, US
505364	0749818	100891	032690	130 WATER STREET, BOSTON, MA 02109, US
5056282	075			

DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN, PETER F. COLESS, EDWARDS & ANGELL, LLP DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & Dike, Bronstein, Roberts & Cushman LLP	Yes	Yes	Yes
Dike, Bronstein, Roberts & Cushman LLP	Yes	Yes	Yes
ERNEST V. LINEK, DIKE BRONSTEIN ROBERTS & ROBERT F. O'CONNELL, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, ESQUIRE, DIKE, BRONSTEIN, DIKE, BRONSTEIN, ROBERTS,, CUSHMAN & PFUND ATTN: DAVID G. CONLIN, DIKE, BRONSTEIN, DIKE, BRONSTEIN, ROBERTS, CUSHMAN & PFUND	Yes	Yes	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN, ROBERT F. O'CONNELL, DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, ESQUIRE, DIKE, BRONSTEIN,	Yes	Yes	Yes
ROBERT M. ASHER, DIKE, BRONSTEIN, ROBERTS DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ROBERT L. GOLDBERG, DIKE, BRONSTEIN, DIKE, BRONSTEIN, ROBERTS, CUSHMAN, & PFUND PATRICIA A. MCDANIELS, DAVID G. CONLIN, DIKE, HENRY D PAHL, JR., DIKE, BRONSTEIN, ROBERTS	Yes	Yes	Yes
ROBERT L. GOLDBERG, DIKE, BRONSEIN, ROBERT L. GOLDBERG, DIKE, BRONSTEIN, DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS & DONALD BROWN, ESQUIRE, DIKE, BRONSTEIN, DONALD BROWN, ESQUIRE, DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes	Yes	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, DONALD BROWN, ESQUIRE, DIKE, BRONSTEIN, DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & DONALD BROWN, DIKE, BRONSTEIN, ROBERTS, GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS DONALD BROWN, ESQ., DIKE, BRONSTEIN, DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & ATTN: DIKE,BRONSTEIN,ROBERTS & CUSHMAN, DAVID G. CONLIN, ESQUIRE, DIKE, BRONSTEIN, DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, DONALD BROWN, ESQ., DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, DONALD BROWN, ESQ., DIKE, BRONSTEIN, HENRY D. PAHL, JR., DIKE, BRONSTEIN, ET AL.	Yes	Yes	Yes
ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN, HENRY D. PAHL, JR., DIKE, BRONSTEIN, ROBERTS	Yes	Yes	Yes



50686117	0753535.6	1110.291	06605.90	130	WATER STREET	BOSTON, MA	02109	US
50686013	0771639	1126.91	0729.90	130	WATER STREET	BOSTON, MA	02109	US
50686143	0718283	1126.91	1130.88	130	WATER STREET	BOSTON, MA	02109	US
50701116	0765448	1203.91	1207.91	130	WATER STREET	BOSTON, MA	02109	US
50703360	07631689	1203.91	1221.90	130	WATER STREET	BOSTON, MA	02109	US
50757575	07628637	1231.91	1207.90	130	WATER STREET	BOSTON, MA	02109	US
5078882	07442999	1010.92	1128.88	130	WATER STREET	BOSTON, MA	02109	US
5079131	07653992	1010.92	1021.91	130	WATER STREET	BOSTON, MA	02109	US
5079235	07665552	1010.92	1011.690	130	WATER STREET	BOSTON, MA	02109	US
5082597	07411666	1012.92	0925.89	130	WATER STREET	BOSTON, MA	02109	US
5082930	07523756	0121.92	0515.90	130	WATER STREET	BOSTON, MA	02109	US
5084302	07503312	0128.92	032.990	130	WATER STREET	BOSTON, MA	02109	US
5084325	076020718	0128.92	0102.490	130	WATER STREET	BOSTON, MA	02109	US
5087247	07571370	0221.92	0828.90	130	WATER STREET	BOSTON, MA	02109	US
5089500	07697260	0218.92	1050.89	130	WATER STREET	BOSTON, MA	02109	US
5091369	07453139	0225.92	1212.89	130	WATER STREET	BOSTON, MA	02109	US
5092367	07466380	0303.92	0312.90	130	WATER STREET	BOSTON, MA	02109	US
50950144	07476654	0225.92	0211.92	130	WATER STREET	BOSTON, MA	02109	US
5095018	07634435	0310.92	0322.91	130	WATER STREET	BOSTON, MA	02109	US
5095039	07533613	0310.92	0609.90	130	WATER STREET	BOSTON, MA	02109	US
5096995	07618734	0317.92	0321.91	130	WATER STREET	BOSTON, MA	02109	US
5097287	07568294	0317.92	031.990	130	WATER STREET	BOSTON, MA	02109	US
5099273	07673236	0324.92	0326.91	130	WATER STREET	BOSTON, MA	02108	US
5100832	07492921	0313.92	0830.90	130	WATER STREET	BOSTON, MA	02109	US
5104305	07575056	0414.92	0834.90	130	WATER STREET	BOSTON, MA	02109	US
5104807	07686037	0414.92	0402.91	130	WATER STREET	BOSTON, MA	02109	US
5104937	07722334	0414.92	0628.91	130	WATER STREET	BOSTON, MA	02109	US
5105335	07534181	0414.92	0606.90	130	WATER STREET	BOSTON, MA	02109	US
5105603	07621588	0421.92	1203.90	130	WATER STREET	BOSTON, MA	02109	US
5106454	07607548	0421.92	1101.90	130	WATER STREET	BOSTON, MA	02109	US
5106949	07407455	0421.92	0915.89	130	WATER STREET	BOSTON, MA	02108	US
5108064	07608989	0428.92	1106.90	130	WATER STREET	BOSTON, MA	02109	US
5108950	07594912	0428.92	1010.90	130	WATER STREET	BOSTON, MA	02109	US
5109120	07564707	0428.92	0609.89	130	WATER STREET	BOSTON, MA	02109	US
5109786	07633241	0505.92	1221.90	130	WATER STREET	BOSTON, MA	02109	US
5112434	07672402	0512.92	0320.91	130	WATER STREET	BOSTON, MA	02109	US
5112609	07627634	0512.92	0521.90	130	WATER STREET	BOSTON, MA	02109	US
5112835	07443930	0512.92	1121.89	130	WATER STREET	BOSTON, MA	02109	US
5120065	07653068	0609.92	0208.91	130	WATER STREET	BOSTON, MA	02109	US
5120578	07731332	0609.92	0729.91	130	WATER STREET	BOSTON, MA	02109	US
5121114	07528873	0609.92	0529.89	130	WATER STREET	BOSTON, MA	02109	US
5128230	07644752	0707.92	0123.91	130	WATER STREET	BOSTON, MA	02109	US
5130410	07681121	0714.92	0227.91	130	WATER STREET	BOSTON, MA	02109	US
5130763	07672464	0728.92	0					

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5161105	5161329	11/03/92	06/27/90	130 WATER STREET	BOSTON, MA 02109	US
5161873	07/841367	11/10/92	02/25/92	130 WATER STREET	BOSTON, MA 02109	US
5162866	07/619239	11/10/92	11/28/90	130 WATER STREET	BOSTON, MA 02109	US
5164279	07/621517	11/17/92	12/03/90	130 WATER STREET	BOSTON, MA 02109	US
5164410	07/714436	11/17/92	06/13/91	130 WATER STREET	BOSTON, MA 02109	US
5164485	07/547948	11/17/92	07/03/90	130 WATER STREET	BOSTON, MA 02109	US
5166611	07/664434	11/24/92	02/12/91	130 WATER STREET	BOSTON, MA 02109	US
5166811	07/641146	11/24/92	01/15/91	130 WATER STREET	BOSTON, MA 02109	US
5170270	07/574485	12/08/92	06/28/90	130 WATER STREET	BOSTON, MA 02109	US
5171736	07/421586	12/25/92	10/16/89	130 WATER STREET	BOSTON, MA 02109	US
5173813	07/893561	12/22/92	06/03/92	130 WATER STREET	BOSTON, MA 02109	US
5175079	07/509680	12/29/92	08/26/91	130 WATER STREET	BOSTON, MA 02109	US
5175519	07/758629	12/29/92	09/12/92	130 WATER STREET	BOSTON, MA 02109	US
5175793	07/473238	12/29/92	07/31/90	130 WATER STREET	BOSTON, MA 02109	US
5177527	07/631718	01/05/93	12/21/90	130 WATER STREET	BOSTON, MA 02109	US
5177539	07/776998	07/05/93	10/16/91	130 WATER STREET	BOSTON, MA 02109	US
5178956	07/418535	07/12/93	10/03/89	130 WATER STREET	BOSTON, MA 02109	US
5179866	07/902458	07/12/93	06/19/91	130 WATER STREET	BOSTON, MA 02109	US
5181106	07/072652	01/26/93	03/20/92	130 WATER STREET	BOSTON, MA 02109	US
5181395	07/533573	02/02/93	06/05/90	130 WATER STREET	BOSTON, MA 02109	US
5184812	07/697329	02/09/93	05/08/91	130 WATER STREET	BOSTON, MA 02109	US
5192444	07/604581	03/09/93	10/29/90	130 WATER STREET	BOSTON, MA 02109	US
5193082	07/502104	03/09/93	03/29/90	130 WATER STREET	BOSTON, MA 02109	US
5194488	07/758876	03/16/93	08/10/91	130 WATER STREET	BOSTON, MA 02109	US
5194890	07/523591	03/16/93	05/15/90	130 WATER STREET	BOSTON, MA 02109	US
5198482	07/540105	03/30/93	08/19/91	130 WATER STREET	BOSTON, MA 02109	US
5200763	07/750575	04/06/93	08/28/91	130 WATER STREET	BOSTON, MA 02109	US
5201852	07/685321	04/13/93	05/19/92	130 WATER STREET	BOSTON, MA 02109	US
5202222	07/663271	04/13/93	03/30/91	130 WATER STREET	BOSTON, MA 02109	US
5204345	07/498301	04/20/93	03/06/90	130 WATER STREET	BOSTON, MA 02109	US
5204380	07/751190	04/20/93	08/24/91	130 WATER STREET	BOSTON, MA 02109	US
5204542	07/745482	04/20/93	08/14/91	130 WATER STREET	BOSTON, MA 02109	US
5206435	07/767134	04/27/93	09/27/91	130 WATER STREET	BOSTON, MA 02109	US
5206634	07/771454	04/27/93	09/30/91	130 WATER STREET	BOSTON, MA 02109	US
5207889	07/719978	05/04/93	06/24/91	130 WATER STREET	BOSTON, MA 02109	US
5207892	07/696933	05/04/93	04/22/91	130 WATER STREET	BOSTON, MA 02109	US
5210000	07/536204	05/11/93	02/06/92	130 WATER STREET	BOSTON, MA 02109	US
5210029	07/539612	05/11/93	06/18/90	130 WATER STREET	BOSTON, MA 02109	US
5216111	07/600962	06/01/93	10/22/90	130 WATER STREET	BOSTON, MA 02109	US
5216264	07/759633	06/01/93	09/16/91	130 WATER STREET	BOSTON, MA 02109	US
5216414	07/613611	06/01/93	11/15/90	130 WATER STREET	BOSTON, MA 02109	US
5219655	07/839737	05/15/93	02/19/92	130 WATER STREET	BOSTON, MA 02109	US
5222318	07/666786	06/29/93	03/08/91	130 WATER STREET	BOSTON, MA 02109	US
5223962	07/788482	06/29/93	11/06/91	130 WATER STREET	BOSTON, MA 02109	US
5225184	07/619880	07/06/93	11/29/90	130 WATER STREET	BOSTON, MA 02109	US
5225584	07/680783	07/06/93	04/03/91	130 WATER STREET	BOSTON, MA 02109	US
5229335	07/711352	07/06/93	07/08/92	130 WATER STREET	BOSTON, MA 02109	US
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52482399	07/482266	059/2893	11/220/90	130 WATER STREET, BOSTON, MA 02109, US
52482396	07/480366	1/005/93	11/220/90	130 WATER STREET, BOSTON, MA 02109, US
52530093	07/783980	1/01/293	1/02/991	130 WATER STREET, BOSTON, MA 02109, US
52524165	07/974045	1/01/993	1/11/892	130 WATER STREET, BOSTON, MA 02109, US
52566418	07/505618	1/02/693	1/04/0690	130 WATER STREET, BOSTON, MA 02109, US
5260720	07/675306	1/109/93	03/26/91	130 WATER STREET, BOSTON, MA 02109, US
52620241	07/868343	1/11/693	12/11/92	130 WATER STREET, BOSTON, MA 02109, US
52622280	07/982337	1/11/693	04/02/92	130 WATER STREET, BOSTON, MA 02109, US
52622303	07/596451	1/11/693	1/01/190	130 WATER STREET, BOSTON, MA 02109, US
52623658	07/663134	1/11/693	03/04/91	130 WATER STREET, BOSTON, MA 02109, US
52628256	07/893452	1/11/693	06/04/92	130 WATER STREET, BOSTON, MA 02109, US
52834477	07/851257	02/01/94	03/11/92	130 WATER STREET, BOSTON, MA 02109, US
52852540	07/895487	02/08/94	05/19/92	130 WATER STREET, BOSTON, MA 02109, US
52867879	07/967709	02/15/94	11/26/91	130 WATER STREET, BOSTON, MA 02109, US
5287145	08/045623	02/15/94	04/09/93	130 WATER STREET, BOSTON, MA 02109, US
5290807	07/917827	03/01/94	07/12/92	130 WATER STREET, BOSTON, MA 02109, US
52931323	07/669292	03/01/94	09/30/91	130 WATER STREET, BOSTON, MA 02109, US
52960663	07/944008	03/02/94	09/11/92	130 WATER STREET, BOSTON, MA 02109, US
53008539	07/822629	05/03/94	01/17/92	130 WATER STREET, BOSTON, MA 02109, US
53090905	07/964934	05/03/94	10/02/92	130 WATER STREET, BOSTON, MA 02109, US
53112098	08/025088	05/17/94	03/02/93	130 WATER STREET, BOSTON, MA 02109, US
53122334	08/011112	05/17/94	01/05/93	130 WATER STREET, BOSTON, MA 02109, US
53132928	07/654104	05/17/94	02/21/91	130 WATER STREET, BOSTON, MA 02109, US
53128444	07/999697	05/17/94	12/24/92	130 WATER STREET, BOSTON, MA 02109, US
53140555	07/935644	05/24/94	08/25/92	130 WATER STREET, BOSTON, MA 02109, US
5314789	07/770016	05/24/94	1/01/191	130 WATER STREET, BOSTON, MA 02109, US
5316683	07/873692	05/31/94	04/12/92	130 WATER STREET, BOSTON, MA 02109, US
5318974	07/841417	06/07/94	03/05/92	130 WATER STREET, BOSTON, MA 02109, US
5319170	07/964079	06/07/94	10/20/92	130 WATER STREET, BOSTON, MA 02109, US
53203052	07/975916	06/21/94	11/13/92	130 WATER STREET, BOSTON, MA 02109, US
5326860	07/940443	07/05/94	09/04/92	130 WATER STREET, BOSTON, MA 02109, US
5328986	07/832845	07/12/94	02/10/92	130 WATER STREET, BOSTON, MA 02109, US
5332843	07/7934570	08/02/94	08/24/92	130 WATER STREET, BOSTON, MA 02109, US
5333530	07/968851	08/09/94	12/04/92	130 WATER STREET, BOSTON, MA 02109, US
5336689	08/105458	08/09/94	08/11/93	130 WATER STREET, BOSTON, MA 02109, US
53429229	07/946943	08/30/94	09/17/92	130 WATER STREET, BOSTON, MA 02109, US
5344947	08/005938	09/06/94	01/15/93	130 WATER STREET, BOSTON, MA 02109, US
5345769	07/975219	09/13/94	11/12/92	130 WATER STREET, BOSTON, MA 02109, US
5347343	08/088876	09/13/94	07/08/93	130 WATER STREET, BOSTON, MA 02109, US
53900537	07/927606	09/27/94	08/10/92	130 WATER STREET, BOSTON, MA 02109, US
53933057	08/185600	10/04/94	12/07/93	130 WATER STREET, BOSTON, MA 02109, US
53933221	07/819223	1/00/194	01/10/92	130 WATER STREET, BOSTON, MA 02109, US
5394497	08/049289	1/01/194	04/19/93	130 WATER STREET, BOSTON, MA 02109, US
5397129	08/015725	1/01/894	11/24/93	130 WATER STREET, BOSTON, MA 02109, US
5398819	08/047469	1/02/594	04/13/93	130 WATER STREET, BOSTON, MA 02109, US
5399660	08/081499	1/01/594	06/22/93	130 WATER STREET, BOSTON, MA 02109, US
53963952	08/19709	1/11/594	09/10/93	130 WATER STREET, BOSTON, MA 02109, US
53964026	07/921226	1/11/594	1/11/491	130 WATER STREET, BOSTON, MA 02109, US
53985172	07/927173	1/11/594	08/07/92	130 WATER STREET, BOSTON, MA 02109, US
5397614	07/766124	1/12/94	09/27/91	130 WATER STREET, BOSTON, MA 02109, US

ATTN: DAVID G. CONLIN, DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
ROBERT F. O'CONNELL, ESQ., DIKE, BRONSTEIN,	Yes
ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
LINDA M. BUCKLEY, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
ROBERT F. O'CONNELL, ESQ., DIKE, BRONSTEIN,	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ET AL	Yes
ROBERT M. ASHER, DIKE, BRONSTEIN, ROBERTS &	Yes
ATTN: DAVID G. CONLIN, DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
ROBERT G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
PETER J. MANUS, DIKE, BRONSTEIN, ROBERTS, &	Yes
ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes
PETER J. MANUS, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERT &	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ET AL,	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes
PETER J. MANUS, DIKE, BRONSTEIN, ROBERTS &	Yes
HENRY D. PAHL, JR., ESQ., DIKE, BRONSTEIN,	Yes
HENRY D. PAHL, JR., ESQ., DIKE, BRONSTEIN,	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes

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5366970	00792360	1126994	1114931	130 WATER STREET	BOSTON	MA	02109	US	04/2019
5374373	00860504	1122094	0505093	130 WATER STREET	BOSTON	MA	02109	US	09/2019
5378810	079494105	0110399	0927192	130 WATER STREET	BOSTON	MA	02109	US	05/2019
5382152	07804751	0111795	0113393	130 WATER STREET	BOSTON	MA	02109	US	11/2019
5384229	07976568	0112495	0507092	130 WATER STREET	BOSTON	MA	02109	US	07/2019
5384480	08066923	0112495	0112293	130 WATER STREET	BOSTON	MA	02109	US	07/2019
5385645	08081039	0131195	0622293	130 WATER STREET	BOSTON	MA	02109	US	06/2019
5385660	08142792	0131195	0622293	130 WATER STREET	BOSTON	MA	02109	US	06/2019
5389203	08115917	021495	0900193	130 WATER STREET	BOSTON	MA	02109	US	09/0193
5400483	08028778	032895	0310993	130 WATER STREET	BOSTON	MA	02109	US	03/0993
5403661	07832421	0404495	0210192	130 WATER STREET	BOSTON	MA	02109	US	02/1092
5405551	07869969	041195	0416192	130 WATER STREET	BOSTON	MA	02109	US	04/1692
5415771	08084811	051695	0629393	130 WATER STREET	BOSTON	MA	02109	US	06/2939
5416071	07909160	051695	0706192	130 WATER STREET	BOSTON	MA	02109	US	07/0692
5416346	08201181	051695	0224194	130 WATER STREET	BOSTON	MA	02109	US	02/2494
5420179	07941121	0530993	0102992	130 WATER STREET	BOSTON	MA	02109	US	01/0292
5422263	08167479	0606095	1215193	130 WATER STREET	BOSTON	MA	02109	US	12/1593
5428584	08097399	0627195	0723393	130 WATER STREET	BOSTON	MA	02109	US	07/2393
5434151	07933991	071895	0824292	130 WATER STREET	BOSTON	MA	02109	US	08/2492
5434246	08033099	071895	031693	130 WATER STREET	BOSTON	MA	02109	US	03/1693
5449130	08049228	0801195	0115193	130 WATER STREET	BOSTON	MA	02109	US	01/1593
5441503	0801886	081595	0114194	130 WATER STREET	BOSTON	MA	02109	US	01/1494
5448399	07943358	1107095	0909092	130 WATER STREET	BOSTON	MA	02109	US	09/0992
5471651	07949215	1128995	1113392	130 WATER STREET	BOSTON	MA	02109	US	11/1392
5471870	07915025	1226995	0715992	130 WATER STREET	BOSTON	MA	02109	US	07/1592
5478971	08283227	1226995	0729994	130 WATER STREET	BOSTON	MA	02109	US	07/2994
5482706	08049402	0110996	0416193	130 WATER STREET	BOSTON	MA	02109	US	04/1693
5486549	08305049	0305996	1206194	130 WATER STREET	BOSTON	MA	02109	US	12/0694
5486834	08300738	0305996	0902194	130 WATER STREET	BOSTON	MA	02109	US	09/0294
5500760	08216628	0319996	0323194	130 WATER STREET	BOSTON	MA	02109	US	03/2394
5525161	08102411	0528996	0805093	130 WATER STREET	BOSTON	MA	02109	US	08/0593
5529134	08290983	0618996	0819194	130 WATER STREET	BOSTON	MA	02109	US	08/1994
5536467	08301604	0716996	0920094	130 WATER STREET	BOSTON	MA	02109	US	09/2094
5536623	08011457	0716996	0129393	130 WATER STREET	BOSTON	MA	02109	US	01/2939
5536640	08148574	0716996	0129393	130 WATER STREET	BOSTON	MA	02109	US	01/2939
5536656	08198089	0716996	0207994	130 WATER STREET	BOSTON	MA	02109	US	02/0794
5538998	08327386	0723996	1027194	130 WATER STREET	BOSTON	MA	02109	US	10/2794
5541231	08296252	0730996	0825194	130 WATER STREET	BOSTON	MA	02109	US	08/2594
5542200	08186003	0806996	0124194	130 WATER STREET	BOSTON	MA	02109	US	01/2494
5552443	08183507	0903996	0718194						

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5619518	08363261	04/08/97	12/23/94	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS	Yes	Yes
5621706	08343007	04/15/97	11/21/94	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5622926	08593535	04/22/97	01/24/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5622966	08464312	04/22/97	06/05/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5624430	08345939	04/28/97	11/28/94	130 WATER STREET, BOSTON, MA 02109, US	PETER J. MANUS, DIKE BRONSTEIN ROBERTS	Yes	Yes
5637622	08464229	06/10/97	05/22/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5637623	08468813	06/10/97	06/06/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5639664	08378296	06/17/97	01/23/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5639781	08495814	06/17/97	06/27/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID S RESNICK, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5639862	08446198	06/17/97	05/19/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5641056	08450006	06/24/97	05/25/95	130 WATER STREET, BOSTON, MA 02109, US	WILLIAM J DALEY JR, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5642300	08592133	07/29/97	01/25/96	130 WATER STREET, BOSTON, MA 02109, US	HENRY D PAHL JR, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5652225	08675523	07/29/97	07/03/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID S RESNICK, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5652269	08464123	07/29/97	06/05/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5658412	08284511	08/19/97	08/08/94	130 WATER STREET, BOSTON, MA 02109, US	DONALD BROWN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5670519	08463420	09/23/97	06/05/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5672608	08343829	09/30/97	11/22/94	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5679550	08551171	10/21/97	10/31/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5681861	08466263	10/28/97	06/06/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5686495	08468031	11/11/97	06/06/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5688789	08450155	11/18/97	05/26/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5689302	08721755	11/18/97	09/30/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5693886	07917842	12/16/97	07/21/92	130 WATER STREET, BOSTON, MA 02109, US	MILTON OLIVER, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5702642	08797348	12/30/97	02/11/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5702824	08440310	12/30/97	04/05/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5710148	08611465	01/20/98	03/04/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERT &	Yes	Yes
5712163	08412982	01/27/98	03/28/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5714238	08757255	02/03/98	11/27/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN	Yes	Yes
5714349	086889190	02/03/98	08/05/96	130 WATER STREET, BOSTON, MA 02109, US	GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
5716356	08617838	02/10/98	05/17/96	130 WATER STREET, BOSTON, MA 02109, US	GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
5725527	08625405	03/10/98	03/27/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5728552	08600545	05/12/98	02/25/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5731111	08823871	03/24/98	03/25/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5741661	08463868	04/27/98	06/05/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5744960	08695174	04/28/98	08/08/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5750213	08808100	05/12/98	02/25/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5750371	08471570	05/12/98	06/06/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5751146	08754745	05/12/98	11/21/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5753171	08727532	05/19/98	10/23/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5756344	08673268	05/26/98	06/28/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5759798	08569873	06/02/98	12/08/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5763881	08086702	06/09/98	07/02/93	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5767162	08470345	06/16/98	06/06/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5782807	08646499	07/21/98	10/20/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5786194	08369130	07/28/98	01/05/95	130 WATER STREET, BOSTON, MA 02109, US	PETER F CORLESS, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5798390	08446451	08/25/98	05/22/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5800665	086737018	09/01/98	10/23/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5800962	08685764	09/01/98	07/24/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5801147	08768725	09/01/98	12/13/96	130 WATER STREET, BOSTON, MA 02109, US	PETER F CORLESS	Yes	Yes
5801884	08727087	09/01/98	10/09/96	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5804435	08741335	09/08/98	10/29/96	130 WATER STREET, BOSTON, MA 02109, US	PETER F CORLESS	Yes	Yes
5807235	08709335	09/15/98	09/27/96	130 WATER STREET, BOSTON, MA 02109, US	GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
5830739	08337318	11/03/98	11/10/94	130 WATER STREET, BOSTON, MA 02109, US	GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
5837737	08485665	11/17/98	06/07/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
5846413	08638116	12/08/98	04/26/96	130 WATER STREET, BOSTON, MA 02109, US	PETER J MANUS, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5846562	08831490	12/08/98	03/28/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
5847006	08454927	12/08/98	05/31/95	130 WATER STREET, BOSTON, MA 02109, US	DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes



58589779	06567748	0111299	1205565	130 WATER STREET	BOSTON, MA	02109	US
58595243	06929763	0112299	1205565	130 WATER STREET	BOSTON, MA	02109	US
58633441	09044753	0126269	0219198	130 WATER STREET	BOSTON, MA	02109	US
58666053	08782955	0202399	0113397	130 WATER STREET	BOSTON, MA	02109	US
5873878	08841156	0202399	0042967	130 WATER STREET	BOSTON, MA	02109	US
5874247	08828787	0223399	0626567	130 WATER STREET	BOSTON, MA	02109	US
5874277	08833099	0223399	0626567	130 WATER STREET	BOSTON, MA	02109	US
5876713	08831445	0302099	0841297	130 WATER STREET	BOSTON, MA	02109	US
58830375	06860554	0316599	0709596	130 WATER STREET	BOSTON, MA	02109	US
58833274	06865666	0316599	067896	130 WATER STREET	BOSTON, MA	02109	US
5886141	04665794	0302399	0606935	130 WATER STREET	BOSTON, MA	02109	US
5888760	08843634	0303099	0041097	130 WATER STREET	BOSTON, MA	02109	US
5891074	06867327	0406099	1002298	130 WATER STREET	BOSTON, MA	02109	US
5892126	06865662	0406099	1114397	130 WATER STREET	BOSTON, MA	02109	US
58989610	08787300	0504099	0124087	130 WATER STREET	BOSTON, MA	02109	US
59004960	08954368	0501899	0202497	130 WATER STREET	BOSTON, MA	02109	US
59086669	08765395	0601099	0106567	130 WATER STREET	BOSTON, MA	02109	US
5911697	06893813	0601599	1218497	130 WATER STREET	BOSTON, MA	02109	US
5919687	08774104	0706099	1224968	130 WATER STREET	BOSTON, MA	02109	US
59228214	08869105	0713399	0604087	130 WATER STREET	BOSTON, MA	02109	US
59227272	08458009	0711399	0602655	130 WATER STREET	BOSTON, MA	02109	US
5932059	08956078	0803099	1002297	130 WATER STREET	BOSTON, MA	02109	US
59369494	09094359	0802099	0302098	130 WATER STREET	BOSTON, MA	02109	US
5939159	08715312	0817099	0891696	130 WATER STREET	BOSTON, MA	02109	US
5939639	08984784	0817799	1204087	130 WATER STREET	BOSTON, MA	02109	US
5940145	08897380	0817799	0721497	130 WATER STREET	BOSTON, MA	02109	US
5947399	08715348	0907099	0712197	130 WATER STREET	BOSTON, MA	02109	US
59530379	08745986	0801499	0802098	130 WATER STREET	BOSTON, MA	02109	US
59539324	09047151	0927199	0824398	130 WATER STREET	BOSTON, MA	02109	US
59595507	084595975	0927199	0602095	130 WATER STREET	BOSTON, MA	02109	US
59602700	08820700	0927199	0513398	130 WATER STREET	BOSTON, MA	02109	US
59686657	08023061	0928099	1201198	130 WATER STREET	BOSTON, MA	02109	US
5969148	08828472	0928099	0303197	130 WATER STREET	BOSTON, MA	02109	US
5969455	08842653	0928099	1006097	130 WATER STREET	BOSTON, MA	02109	US
5969517	08976842	1005099	1125497	130 WATER STREET	BOSTON, MA	02109	US
5964762	090606335	101299	0505098	130 WATER STREET	BOSTON, MA	02109	US
5965255	09142304	101299	0903098	130 WATER STREET	BOSTON, MA	02109	US
5971061	09158439	1026099	09027198	130 WATER STREET	BOSTON, MA	02109	US
5972031	08936403	1026099	0926567	130 WATER STREET	BOSTON, MA	02109	US
5972457	08987888	1026099	1126567	130 WATER STREET	BOSTON, MA	02109	US
5972828	08998262	1026099	1224797	130 WATER STREET	BOSTON, MA	02109	US
5976499	08741122	1102099	0904096	130 WATER STREET	BOSTON, MA	02109	US
5980687	08144882	1109099	1108096	130 WATER STREET	BOSTON, MA	02109	US
5981197	09027655	1109099	0223398	130 WATER STREET	BOSTON, MA	02109	US
5981486	08814806	1119099	0301097	130 WATER STREET	BOSTON, MA	02109	US
59866072	08793927	1116099	0202507	130 WATER STREET	BOSTON, MA	02109	US
5989290	08952908						

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60133/84	089020.3	0.11/1.00	0.72/9.97	30 WATER STREET	BOSTON, MA	02/109	US
60155/52	089030.51	0.11/1.00	0.81/3.97	30 WATER STREET	BOSTON, MA	02/109	US
60175/88	090207.55	0.12/5.00	0.22/5.98	130 WATER STREET	BOSTON, MA	02/109	US
60179/10	084517.26	0.12/5.00	0.56/2.95	130 WATER STREET	BOSTON, MA	02/109	US
60225/33	090003.14	0.07/0.00	0.12/0.98	130 WATER STREET	BOSTON, MA	02/109	US
60233/55	088653.99	0.27/5.00	0.51/9.97	130 WATER STREET	BOSTON, MA	02/109	US
60254/67	090443.56	0.21/5.00	0.51/9.98	130 WATER STREET	BOSTON, MA	02/109	US
60304/18	090455.49	0.22/2.00	0.51/3.98	130 WATER STREET	BOSTON, MA	02/109	US
60342/17	089289.17	0.32/0.00	0.91/2.67	130 WATER STREET	BOSTON, MA	02/109	US
60427/14	091151.58	0.32/8.00	0.71/9.98	130 WATER STREET	BOSTON, MA	02/109	US
60491/48	091660.84	0.41/1.00	1.00/2.98	130 WATER STREET	BOSTON, MA	02/109	US
60510/26	090706.43	0.41/8.00	0.43/3.98	130 WATER STREET	BOSTON, MA	02/109	US
60529/10	091441.42	0.41/25.00	0.90/1.98	130 WATER STREET	BOSTON, MA	02/109	US
60534/41	089223.57	0.42/25.00	0.95/0.97	130 WATER STREET	BOSTON, MA	02/109	US
60537/11	078947.71	0.50/5.00	0.61/0.92	130 WATER STREET	BOSTON, MA	02/109	US
60579/94	093251.76	0.50/2.00	0.60/3.99	130 WATER STREET	BOSTON, MA	02/109	US
60654/10	098724.17	0.52/3.00	0.60/9.99	130 WATER STREET	BOSTON, MA	02/109	US
60689/90	091573.39	0.52/30.00	0.91/8.98	130 WATER STREET	BOSTON, MA	02/109	US
60719/69	092617.00	0.56/0.00	0.60/5.95	130 WATER STREET	BOSTON, MA	02/109	US
60765/72	09251.601	0.62/20.00	0.62/1.95	130 WATER STREET	BOSTON, MA	02/109	US
60873/46	095643.62	0.77/1.00	0.22/1.96	130 WATER STREET	BOSTON, MA	02/109	US
60901/17	093085.17	0.71/8.00	0.52/2.99	130 WATER STREET	BOSTON, MA	02/109	US
60927/124	089559.53	0.80/1.00	1.02/3.97	130 WATER STREET	BOSTON, MA	02/109	US
61039/82	091056.18	0.81/5.00	0.62/6.96	130 WATER STREET	BOSTON, MA	02/109	US
61056/26	08731.156	0.92/22.00	0.72/8.98	130 WATER STREET	BOSTON, MA	02/109	US
61108/91	081418.21	0.92/29.00	0.82/8.98	130 WATER STREET	BOSTON, MA	02/109	US
61109/09	090432.85	0.92/29.00	0.93/21.98	130 WATER STREET	BOSTON, MA	02/109	US
61202/27	093484.18	0.91/9.00	0.70/7.99	130 WATER STREET	BOSTON, MA	02/109	US
61210/57	090763.98	0.91/9.00	0.51/3.98	130 WATER STREET	BOSTON, MA	02/109	US
61212/46	084559.98	0.91/9.00	1.02/0.95	130 WATER STREET	BOSTON, MA	02/109	US
61326/68	08715.998	0.91/7.00	1.02/0.96	130 WATER STREET	BOSTON, MA	02/109	US
61329/88	087381.68	1.07/7.00	1.02/5.96	130 WATER STREET	BOSTON, MA	02/109	US
61330/32	090933.27	1.01/7.00	0.93/9.98	130 WATER STREET	BOSTON, MA	02/109	US
61360/24	093195.27	1.02/4.00	0.60/4.99	130 WATER STREET	BOSTON, MA	02/109	US
61433/91	084829.84	1.10/7.00	0.98/28.98	130 WATER STREET	BOSTON, MA	02/109	US
61470/51	085610.96	1.11/4.00	1.12/2.95	130 WATER STREET	BOSTON, MA	02/109	US
61470/63	084567.41	1.11/4.00	0.60/2.95	130 WATER STREET	BOSTON, MA	02/109	US
61478/45	092879.79	1.11/4.00	0.60/7.99	130 WATER STREET	BOSTON, MA	02/109	US
61501/78	092754.76	1.12/1.00	0.92/4.99	130 WATER STREET	BOSTON, MA	02/109	US
61513/63	088931.32	1.12/1.00	0.71/5.97	130 WATER STREET	BOSTON, MA	02/109	US
61536/04	094589.61	1.12/8.00	0.60/8.95	130 WATER STREET	BOSTON, MA	02/109	US
61553/68	093198.16	1.12/8.00	0.60/8.99	130 WATER STREET	BOSTON, MA	02/109	US
61553/31	095178.98	1.20/5.00	0.51/7.96	130 WATER STREET	BOSTON, MA	02/109	US

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6197220	09031068	0262701	0712736	130 WATER STREET, BOSTON, MA 02109, US
6204278	09885824	0320001	0541937	130 WATER STREET, BOSTON, MA 02109, US
6206701	09352559	0327701	0711339	130 WATER STREET, BOSTON, MA 02109, US
6207431	09182983	0327201	1025036	130 WATER STREET, BOSTON, MA 02109, US
6218367	09395843	0417101	0914459	130 WATER STREET, BOSTON, MA 02109, US
6228355	09108966	0424001	1210398	130 WATER STREET, BOSTON, MA 02109, US
6228324	09781614	0508001	1123298	130 WATER STREET, BOSTON, MA 02109, US
6228864	08747691	0508001	0862599	130 WATER STREET, BOSTON, MA 02109, US
6229422	09444891	0508001	1122299	130 WATER STREET, BOSTON, MA 02109, US
6231355	09331454	0515101	0621199	130 WATER STREET, BOSTON, MA 02109, US
6232288	09051624	0515101	0441598	130 WATER STREET, BOSTON, MA 02109, US
6232445	09860190	0515101	1029297	130 WATER STREET, BOSTON, MA 02109, US
6235222	09456754	0522201	1202899	130 WATER STREET, BOSTON, MA 02109, US
6235371	09456754	0522201	1202899	130 WATER STREET, BOSTON, MA 02109, US
6235374	09813351	0522201	0711939	130 WATER STREET, BOSTON, MA 02109, US
6235678	09813014	0522201	0904049	130 WATER STREET, BOSTON, MA 02109, US
6236568	09470066	0522201	1222299	130 WATER STREET, BOSTON, MA 02109, US
6238065	09207073	0529001	1208098	130 WATER STREET, BOSTON, MA 02109, US
6241174	09308556	0605001	0520299	130 WATER STREET, BOSTON, MA 02109, US
6242198	09886494	0605001	0722596	130 WATER STREET, BOSTON, MA 02109, US
6251523	09329427	0626001	0611099	130 WATER STREET, BOSTON, MA 02109, US
6251961	09881878	0626001	1111099	130 WATER STREET, BOSTON, MA 02109, US
6251948	094680028	0626001	0606065	130 WATER STREET, BOSTON, MA 02109, US
6254598	09173918	0703001	1041698	130 WATER STREET, BOSTON, MA 02109, US
6258561	09421208	0710001	1020299	130 WATER STREET, BOSTON, MA 02109, US
6263039	09810539	0710001	0730097	130 WATER STREET, BOSTON, MA 02109, US
6263039	09477312	0710001	0104000	130 WATER STREET, BOSTON, MA 02109, US
6274235	09341088	0914001	0630099	130 WATER STREET, BOSTON, MA 02109, US
6274296	09595040	0914001	0608000	130 WATER STREET, BOSTON, MA 02109, US
6276339	09555422	0921001	0550000	130 WATER STREET, BOSTON, MA 02109, US
6277643	09351119	0921001	0771099	130 WATER STREET, BOSTON, MA 02109, US
6280073	09303953	0828001	0503099	130 WATER STREET, BOSTON, MA 02109, US
6286454	09583161	0911101	0550000	130 WATER STREET, BOSTON, MA 02109, US
6286717	09423216	0911101	1102099	130 WATER STREET, BOSTON, MA 02109, US
6297815	09456703	1002001	1209099	130 WATER STREET, BOSTON, MA 02109, US
6298880	09627119	1009001	0727000	130 WATER STREET, BOSTON, MA 02109, US
6300457	09343445	1009001	1102099	130 WATER STREET, BOSTON, MA 02109, US
6300682	09547157	1023001	0411000	130 WATER STREET, BOSTON, MA 02109, US
6313343	09462517	1106001	0130700	130 WATER STREET, BOSTON, MA 02109, US
6316198	09838115	1113001	0101800	130 WATER STREET, BOSTON, MA 02109, US
6321885	09810314	1127001	0906299	130 WATER STREET, BOSTON, MA 02109, US
6339007	09244495	0107002	1172499	130 WATER STREET, BOSTON, MA 02109, US
6342208	09230777	0129002	0308099	130 WATER STREET, BOSTON, MA 02109, US
6348580	09251069	0219102	0827000	130 WATER STREET, BOSTON, MA 02109, US
6350560	09633539	0226002	0820700	130 WATER STREET, BOSTON, MA 02109, US
6352141	09553470	0305002	0950000	130 WATER STREET, BOSTON, MA 02109, US
6352827	09808494	0305002	0807097	130 WATER STREET, BOSTON, MA 02109, US
6353105	09314441	0305002	0519199	130 WATER STREET, BOSTON, MA 02109, US
6358993	09425582	0319102	1022299	130 WATER STREET, BOSTON, MA 02109, US
6365148	09293534	0402002	0414000	130 WATER STREET, BOSTON, MA 02109, US
6368713	09271708	0409002	0418099	130 WATER STREET, BOSTON, MA 02109, US
6372065	09511543	0416102	0222000	130 WATER STREET, BOSTON, MA 02109, US
6372560	09504053	0416102	0233100	130 WATER STREET, BOSTON, MA 02109, US
6379803</				

DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS AND CUSHMAN	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN LLP	Yes	Yes	Yes
RONALD I EISENSTEIN, DIKE BRONSTEIN ROBERT F CORLESS, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND PETER F CORLESS	Yes	Yes	Yes
PETER F CORLESS	Yes	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & PETER F CORLESS	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN LLP	Yes	Yes	Yes
DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes	Yes
S Matthew Cairns, c/o Dike Bronstein Roberts & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & PETER F CORLESS	Yes	Yes	Yes
Peter F Corless	Yes	Yes	Yes
David G Conlin, Dike Bronstein Roberts & Cushman LP	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS CUSHMAN	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN LLP	Yes	Yes	Yes
Dike Bronstein Roberts & Cushman	Yes	Yes	Yes
LINDA M BUCKLEY, DIKE BRONSTEIN ROBERTS & Peter F Corless	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes	Yes
Dike Bronstein Roberts & Cushman LLP	Yes	Yes	Yes
GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & S. Matthew Cairns, Dike Bronstein Roberts & Cushman	Yes	Yes	Yes
GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS PETER F CORLESS, DIKE BRONSTEIN ROBERTS, GEORGE W NEUNER ESQ, DIKE BRONSTEIN DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS AND S. Matthew Cairns, c/o Dike, Bronstein, Roberts & Dike Bronstein Roberts & Cushman LLP	Yes	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes	Yes



63833269	09490928	05/07/02	01/25/00	130 Water Street, Boston, MA 02109, US
6391856	09190043	05/27/02	11/10/98	130 WATER STREET, BOSTON, MA 02109, US
6406828	09511726	06/18/02	02/24/00	130 Water Street, Boston, MA 02109, US
6430441	09460326	07/16/02	12/10/99	130 WATER STREET, BOSTON, MA 02109, US
6433803	09826199	08/13/02	04/04/01	130 Water Street, Boston, MA 02109, US
6437635	09532256	08/20/02	03/22/00	130 Water Street, Boston, MA 02109, US
6440642	09397301	08/27/02	09/15/99	130 WATER STREET, BOSTON, MA 02109, US
6455331	09433153	08/24/02	11/03/99	130 WATER STREET, BOSTON, MA 02109, US
	07475735		02/05/90	130 WATER STREET, BOSTON, MA 02109, US
	07521741		05/10/90	130 WATER STREET, BOSTON, MA 02109, US
	07907863		07/02/92	130 WATER STREET, BOSTON, MA 02109, US
	08088238		07/07/93	130 WATER STREET, BOSTON, MA 02109, US
	08091399		07/23/93	130 WATER STREET, BOSTON, MA 02109, US
	08387830		02/16/95	130 WATER STREET, BOSTON, MA 02109, US
	08446230		12/28/99	130 WATER STREET, BOSTON, MA 02109, US
	08689406		08/09/96	130 WATER STREET, BOSTON, MA 02109, US
	08909515		08/12/97	130 WATER STREET, BOSTON, MA 02109, US
	08923155		09/04/97	130 WATER STREET, BOSTON, MA 02109, US
	08957358		10/23/97	130 WATER STREET, BOSTON, MA 02109, US
	09073305		05/05/98	130 WATER STREET, BOSTON, MA 02109, US
	09076370		05/11/98	130 WATER STREET, BOSTON, MA 02109, US
	09102446		06/22/98	130 WATER STREET, BOSTON, MA 02109, US
	09120579		07/22/98	130 WATER STREET, BOSTON, MA 02109, US
	09155635		07/09/99	130 WATER STREET, BOSTON, MA 02109, US
	09169028		10/09/98	130 WATER STREET, BOSTON, MA 02109, US
	09171545		07/26/99	130 WATER STREET, BOSTON, MA 02109, US
	09293854		04/16/99	130 WATER STREET, BOSTON, MA 02109, US
	09300639		04/27/99	130 WATER STREET, BOSTON, MA 02109, US
	09347360		07/06/99	130 WATER STREET, BOSTON, MA 02109, US
	09360001		08/11/99	130 WATER STREET, BOSTON, MA 02109, US
	09372635		08/11/99	130 WATER STREET, BOSTON, MA 02109, US
	09413763		10/07/99	130 WATER STREET, BOSTON, MA 02109, US
	09419354		10/15/99	130 WATER STREET, BOSTON, MA 02109, US
	09425146		10/21/99	130 WATER STREET, BOSTON, MA 02109, US
	09471829		12/23/99	130 WATER STREET, BOSTON, MA 02109, US
	09489383		01/12/00	130 Water Street, Boston, MA 02109, US
	09506210		02/17/00	130 Water Street, Boston, MA 02109, US
	09508594		07/17/00	130 WATER STREET, BOSTON, MA 02109, US
	09523776		03/11/00	130 Water Street, Boston, MA 02109, US
	09537367		03/29/00	130 Water Street, Boston, MA 02109, US
	09542419		04/04/00	130 Water Street, Boston, MA 02109, US
	09546811		04/11/00	130 Water Street, Boston, MA 02109, US
	09547941		04/11/00	130 Water Street, Boston, MA 02109, US
	09551965		04/19/00	130 Water Street, Boston, MA 02109, US
	09557483		04/24/00	130 Water Street, Boston, MA 02109, US
	09560614		04/26/00	130 Water Street, Boston, MA 02109, US
	09563672		05/02/00	130 WATER STREET, BOSTON, MA 02109, US
	09568106		05/10/00	130 Water Street, Boston, MA 02109, US
	09571119		05/12/00	130 Water Street, Boston, MA 02109, US
	09587947		06/06/00	130 Water Street, Boston, MA 02109, US
	09622754		08/21/00	130 water Street, Boston, MA 02109, US
	09628875		07/29/00	130 Water Street, Boston, MA 02109, US
	09645198		08/25/00	130 Water Street, Boston, MA 02109, US
	09648022		08/25/00	130 Water Street, Boston, MA 02109, US
	09661746		09/14/00	130 Water Street, Boston, MA 02109, US
	09672915		09/28/00	130 Water Street, Boston, MA 02109, US

S. Matthew Cairns, Dike Bronstein Roberts & Cushman	Yes	Yes
GEORGE W NEUNER, DIKE BRONSTEIN ROBERT & S. Matthew Cairns, c/o Dike, Bronstein, Roberts & S. Matthew Cairns, C/O DIKE BRONSTEIN	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
David G Conlin, Dike Bronstein Roberts & Cushman LP	Yes	Yes
S MATTHEW CAIRNS ESQ, C/O DIKE BRONSTEIN	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & ROBERT F. O'CONNELL, DIKE, BRONSTEIN, DONALD BROWN, DIKE, BRONSTEIN, ROBERTS & ROBERT L GOLDBERG, DIKE, BRONSTEIN, ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN, DONALD BROWN, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & DAVID J MANUS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
LINDA M BUCKLEY, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS AND CUSHMAN	Yes	Yes
PETER J MANUS, DIKE BRONSTEIN ROBERTS & DAVID G CONLIN, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERT & CUSHMAN	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
DIKE BRONSTEIN, ROBERTS AND CUSHMAN, LLP, PETER F CORLESS, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN LP	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & ROBERT L GOLDBERG, DIKE BRONSTEIN ROBERTS & PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
David G Conlin, Dike Bronstein Roberts & Cushman LP	Yes	Yes
Dike Bronstein Roberts & Cushman LLP	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN ROBERTS & DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
Linda M Buckley, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
Christine C O'Day	Yes	Yes
Dike Bronstein Roberts & Cushman LLP	Yes	Yes
Dike Bronstein Roberts & Cushman LLP	Yes	Yes
PETER F CORLESS, DIKE BRONSTEIN, ROBERTS & George W Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
Jennifer K Holmes, Dike Bronstein Roberts & Cushman	Yes	Yes
George W Neuner	Yes	Yes
S Matthew Cairns, C/o Dike Bronstein Roberts & Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
EDWARDS & ANGEL LLP, Dike Bronstein Roberts & Edwards & Angel LLP	Yes	Yes

0961197	10/27/00	130 Water Street, Boston	MA 02109	US
09696673	10/27/00	130 Water Street, Boston	MA 02109	US
09711009	11/09/00	130 Water Street, Boston	MA 02109	US
09713694	11/15/00	130 Water Street, Boston	MA 02109	US
09716147	11/17/00	130 Water Street, Boston	MA 02109	US
09719316	12/11/00	130 Water Street, Boston	MA 02109	US
09721469	11/22/00	130 Water Street, Boston	MA 02109	US
09725414	11/29/00	130 Water Street, Boston	MA 02109	US
09729768	11/30/00	130 Water Street, Boston	MA 02109	US
09732043	12/07/00	130 Water Street, Boston	MA 02109	US
09738851	12/15/00	130 Water Street, Boston	MA 02109	US
09746885	12/21/00	130 Water Street, Boston	MA 02109	US
09755905	01/11/01	130 Water Street, Boston	MA 02109	US
09759402	12/28/00	130 Water Street, Boston	MA 02109	US
09759599	01/11/01	130 Water Street, Boston	MA 02109	US
09766725	01/12/01	130 Water Street, Boston	MA 02109	US
09772325	01/29/01	130 Water Street, Boston	MA 02109	US
09775167	02/01/01	130 Water Street, Boston	MA 02109	US
09777314	02/05/01	130 Water Street, Boston	MA 02109	US
09779365	02/07/01	130 Water Street, Boston	MA 02109	US
09780999	02/09/01	130 Water Street, Boston	MA 02109	US
09781642	02/12/01	130 Water Street, Boston	MA 02109	US
09781650	02/12/01	130 Water Street, Boston	MA 02109	US
09782527	02/13/01	130 Water Street, Boston	MA 02109	US
09786261	06/07/01	130 Water Street, Boston	MA 02109	US
09787194	03/15/01	130 Water Street, Boston	MA 02109	US
09788111	02/17/01	130 Water Street, Boston	MA 02109	US
09788981	02/20/01	130 Water Street, Boston	MA 02109	US
09790442	02/21/01	130 Water Street, Boston	MA 02109	US
09794835	02/27/01	130 Water Street, Boston	MA 02109	US
09795658	02/28/01	130 Water Street, Boston	MA 02109	US
09795832	02/28/01	130 Water Street, Boston	MA 02109	US
09798219	03/02/01	130 Water Street, Boston	MA 02109	US
09798394	03/02/01	130 Water Street, Boston	MA 02109	US
09798928	03/05/01	130 Water Street, Boston	MA 02109	US
09800800	03/07/01	130 Water Street, Boston	MA 02109	US
098003312	03/09/01	130 Water Street, Boston	MA 02109	US
09804825	03/13/01	130 Water Street, Boston	MA 02109	US
09804972	03/13/01	130 Water Street, Boston	MA 02109	US
09806992	04/06/01	130 Water Street, Boston	MA 02109	US
09808320	03/14/01	130 Water Street, Boston	MA 02109	US
09808324	03/14/01	130 Water Street, Boston	MA 02109	US
09809661	03/15/01	130 Water Street, Boston	MA 02109	US
09815594	03/23/01	130 Water Street, Boston	MA 02109	US
09819474	03/28/01	130 Water Street, Boston	MA 02109	US
09821605	03/29/01	130 Water Street, Boston	MA 02109	US
09822719	03/30/01	130 Water Street, Boston	MA 02109	US
09823202	03/29/01	130 Water Street, Boston	MA 02109	US
09824554	04/02/01	130 Water Street, Boston	MA 02109	US
09831738	05/11/01	130 Water Street, Boston	MA 02109	US
09833405	04/11/01	130 Water Street, Boston	MA 02109	US
09833988	04/12/01	130 Water Street, Boston	MA 02109	US
09839947	04/20/01	130 Water Street, Boston	MA 02109	US
09841150	04/27/01	130 Water Street, Boston	MA 02109	US
09850978	05/08/01	130 Water Street, Boston	MA 02109	US
09851838	05/09/01	130 Water Street, Boston	MA 02109	US
09857141	10/24/01	130 Water Street, Boston	MA 02109	US

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09657398	0608101	130 Water Street, Boston, MA 02109, US
09657815	0608001	130 Water Street, Boston, MA 02109, US
09659089	0591601	130 Water Street, Boston, MA 02109, US
09664818	052401	130 Water Street, Boston, MA 02109, US
09665540	062701	130 Water Street, Boston, MA 02109, US
09671468	053101	130 Water Street, Boston, MA 02109, US
09672735	060101	130 Water Street, Boston, MA 02109, US
09675695	060601	130 Water Street, Boston, MA 02109, US
09676554	060701	130 Water Street, Boston, MA 02109, US
09679304	061201	130 Water Street, Boston, MA 02109, US
09681279	061401	130 Water Street, Boston, MA 02109, US
09681399	061401	130 Water Street, Boston, MA 02109, US
09685312	062001	130 Water Street, Boston, MA 02109, US
09689185	070301	130 Water Street, Boston, MA 02109, US
09690167	071801	130 Water Street, Boston, MA 02109, US
09690780	0711201	130 Water Street, Boston, MA 02109, US
09911118	072301	130 Water Street, Boston, MA 02109, US
09915087	072501	130 Water Street, Boston, MA 02109, US
09920383	080101	130 Water Street, Boston, MA 02109, US
09924698	080901	130 Water Street, Boston, MA 02109, US
09925907	080901	130 Water Street, Boston, MA 02109, US
09937786	072802	130 Water Street, Boston, MA 02109, US
09943611	082001	130 Water Street, Boston, MA 02109, US
09950889	091001	130 Water Street, Boston, MA 02109, US
09952183	091301	130 Water Street, Boston, MA 02109, US
09954288	091701	130 Water Street, Boston, MA 02109, US
09954827	091801	130 Water Street, Boston, MA 02109, US
09958287	091901	130 Water Street, Boston, MA 02109, US
09959045	100201	130 Water Street, Boston, MA 02109, US
09961812	092401	130 Water Street, Boston, MA 02109, US
09964131	092601	130 Water Street, Boston, MA 02109, US
09968148	100101	130 Water Street, Boston, MA 02109, US
09971207	100401	130 Water Street, Boston, MA 02109, US
09974297	100401	130 Water Street, Boston, MA 02109, US
09974418	101001	130 Water Street, Boston, MA 02109, US
09975544	101101	130 Water Street, Boston, MA 02109, US
09977815	101501	130 Water Street, Boston, MA 02109, US
09979546	112001	130 Water Street, Boston, MA 02109, US
09980787	111401	130 Water Street, Boston, MA 02109, US
09994024	111401	130 Water Street, Boston, MA 02109, US
10000239	110201	130 Water Street, Boston, MA 02109, US
10000833	109101	130 WATER STREET, BOSTON, MA 02109, US
10002949	111501	130 Water Street, Boston, MA 02109, US
10002952	111501	130 Water Street, Boston, MA 02109, US
10009158	102501	130 Water Street, Boston, MA 02109, US
10014311	121101	130 Water Street, Boston, MA 02109, US
10023062	121401	130 Water Street, Boston, MA 02109, US
10030568	101402	130 Water Street, Boston, MA 02109, US
10033117	102501	130 Water Street, Boston, MA 02109, US
10034669	121901	130 Water Street, Boston, MA 02109, US
10034865	122701	130 Water Street, Boston, MA 02109, US
10035112	122601	130 Water Street, Boston, MA 02109, US
10036184	122601	130 Water Street, Boston, MA 02109, US
10037940	010402	130 Water Street, Boston, MA 02109, US
10041902	010802	130 Water Street, Boston, MA 02109, US
10045697	011402	130 Water Street, Boston, MA 02109, US
10061645	020702	130 Water Street, Boston, MA 02109, US

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Dike Bronstein, Roberts & Cushman	Yes	Yes
David G. Conlin, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F. Corless	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
Dike Bronstein Roberts & Cushman	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
S., Matthew Cairns, c/o Dike, Bronstein, Roberts &	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
Dike Bronstein Roberts & Cushman	Yes	Yes
S., Matthew Cairns, c/o Dike, Bronstein, Roberts &	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
David G. Conlin Esq., Dike Bronstein Roberts &	Yes	Yes
Dike Bronstein Roberts & Cushman LLP	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP	Yes	Yes
Dike, Bronstein, Roberts Cushman, LLP	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	No	No
DONALD BROWN ESQ., DIKE, BRONSTEIN,	Yes	Yes
DONALD BROWN ESQ., DIKE, BRONSTEIN,	Yes	Yes
ROBERT L., GOLDBERG, ESQ., DIKE, BRONSTEIN,	Yes	Yes
LINDA M. BUCKLEY, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
LINDA M. BUCKLEY, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
NONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN AND CUSHMAN	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
DAVID S. RESNICK, DIKE, BRONSTEIN ROBERTS AND	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS AND	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
LINDA M BUCKLEY, DIKE BRONSTEIN ROBERTS	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
DONALD BROWN, DIKE BRONSTEIN ROBERTS &	Yes	Yes
ERNEST V. LINKE, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
ERNEST V. LINKE, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
LINDA M BUCKLEY, DIKE BRONSTEIN ROBERTS	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN ROBERTS &	Yes	Yes
GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
ERNEST V. LINKE, DIKE, BRONSTEIN, ROBERTS &	Yes	Yes
GEORGE W NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
DIKE BRONSTEIN ROBERTS & CUSHMAN	Yes	Yes
GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes	Yes
GEORGE W. NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes	Yes
DAVID G. CONLIN	Yes	Yes

61233.57	091232.5	0926.00	0726.98	130	Water STREET, Boston, MA 02109-4280, US
62971.864	096230.07	0918.01	0731.00	130	Water Street, Boston, MA 02109-4280, US
63762.39	098328.867	0923.02	0404.97	130	Water Street, Boston, MA 02109-4280, US
	0967.6130		1004.00	130	Water Street, Boston, MA 02109-4280, US
	091604.95		0113.01	130	Water Street, Boston, MA 02109-4280, US
	0991194.9		0319.01	130	Water Street, Boston, MA 02109-4280, US
	099201.02		0328.01	130	Water Street, Boston, MA 02109-4280, US
	0982317.6		0329.01	130	Water Street, Boston, MA 02109-4280, US
	0983394.5		0419.01	130	Water Street, Boston, MA 02109-4280, US
	0984346.8		0426.01	130	Water Street, Boston, MA 02109-4280, US
	0984247.9		0426.01	130	Water Street, Boston, MA 02109-4280, US
	0984646.2		0501.01	130	Water Street, Boston, MA 02109-4280, US
	0984655.8		0426.01	130	Water Street, Boston, MA 02109-4280, US
	0984813.7		0503.01	130	Water Street, Boston, MA 02109-4280, US
	098706.03		0530.01	130	Water Street, Boston, MA 02109-4280, US
	0986255.8		0925.01	130	Water Street, Boston, MA 02109-4280, US
	0986633.9		1002.01	130	Water Street, Boston, MA 02109-4280, US
	1000062.9		1031.01	130	Water Street, Boston, MA 02109-4280, US
	1006882.2		0205.02	130	Water Street, Boston, MA 02109-4280, US
6365444.82	098121.06	0402.02	0319.01	130	Water Street, Boston, MA 02109-4280, US
451.3831	064996.42	0430.85	0509.83	130	Water STREET, Boston, MA 02109-4280, US
4522246.2	094966.60	0611.85	0527.83	130	Water STREET, Boston, MA 02109-4280, US
462634.5	0966467.89	1202.86	0904.84	130	Water STREET, Boston, MA 02109-4280, US
46294.14	061638.24	1216.86	1008.85	130	Water STREET, Boston, MA 02109-4280, US
46327.95	0665126.9	0120.87	1002.84	130	Water STREET, Boston, MA 02109-4280, US
475527.2	0668801.6	0823.88	1231.84	130	Water STREET, Boston, MA 02109-4280, US
478142.7	0677793.4	1101.68	0919.65	130	Water STREET, Boston, MA 02109-4280, US
480262.8	0707119.3	0207.89	0709.87	130	Water STREET, Boston, MA 02109-4280, US
480523.4	0681366.2	0214.89	0930.86	130	Water STREET, Boston, MA 02109-4280, US
48363.93	0705194.5	0530.89	1062.87	130	Water STREET, Boston, MA 02109-4280, US
48462.93	072564.93	0711.89	1014.28	130	Water STREET, Boston, MA 02109-4280, US
48464.60	0704561.6	0711.89	0513.87	130	Water STREET, Boston, MA 02109-4280, US
48848.00	073487.82	1205.89	0520.87	130	Water STREET, Boston, MA 02109-4280, US
48989.30	070528.47	0526.92	0520.87	130	Water STREET, Boston, MA 02109-4280, US
48996.00	070258.66	0213.90	0316.67	130	Water STREET, Boston, MA 02109-4280, US
49336.00	070907.75	0508.90	0928.87	130	Water STREET, Boston, MA 02109-4280, US
49485.66	071004.90	0814.90	0924.87	130	Water STREET, Boston, MA 02109-4280, US
49666.07	072064.84	1030.90	0613.68	130	Water STREET, Boston, MA 02109-4280, US
50240.99	071361.17	1204.90	0318.88	130	Water STREET, Boston, MA 02109-4280, US
50376.16	070968.71	0806.91	0918.87	130	Water STREET, Boston, MA 02109-4280, US
50785.60	074403.14	0107.92	1122.89	130	Water STREET, Boston, MA 02109-4280, US
50786.61	075238.90	0107.92	0517.90	130	Water STREET, Boston, MA 02109-4280, US
51175.59	074632.47	0526.92	0110.90	130	Water STREET, Boston, MA 02109-4280, US
51176.56	074703.85	0526.92	0128.90	130	Water STREET, Boston, MA 02109-4280, US
51322.83	076366.56	0728.92	0110.91	130	Water STREET, Boston, MA 02109-4280, US
51455.82	071617.89	0908.92	1121.90	130	Water STREET, Boston, MA 02109-4280, US
51606.11	071553.23	1103.92	0906.91	130	Water STREET, Boston, MA 02109-4280, US
51733.21	07577.87.8	1222.92	0905.90	130	Water STREET, Boston, MA 02109-4280, US
51909.76	078440.88	0302.93	0302.92	130	Water STREET, Boston, MA 02109-4280, US
52214.39	071160.93	0622.93	0617.91	130	Water STREET, Boston, MA 02109-4280, US
52222.					

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5350714	08148354	09/27/94	11/08/93	130 WATER STREET, BOSTON, MA 021094280, US	ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
537436	08104801	12/20/94	08/09/93	130 WATER STREET, BOSTON, MA 021094280, US	ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
5395652	08177593	03/07/95	01/05/94	130 WATER STREET, BOSTON, MA 021094280, US	ROBERT L. GOLDBERG, DIKE, BRONSTEIN,	Yes
5448572	07836986	08/28/95	02/14/92	130 WATER STREET, BOSTON, MA 021094280, US	C/O DIKE, BRONSTEIN, ROBERTS & CUSHMAN,	Yes
5455513	08163356	10/03/95	12/07/93	130 WATER STREET, BOSTON, MA 021094280, US	HENRY D. PAHL, JR., DIKE, BRONSTEIN, ROBERTS	Yes
5466206	08236484	11/14/95	04/29/94	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes
5488914	08111391	02/06/96	08/25/93	130 WATER STREET, BOSTON, MA 021094280, US	HENRY D. PAHL, JR., DIKE, BRONSTEIN, ROBERTS &	Yes
5489273	08321206	02/06/96	10/07/94	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
5532132	08127977	07/02/96	09/28/93	130 WATER STREET, BOSTON, MA 021094280, US	DAVID S. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
553406	08175303	07/09/96	12/29/93	130 WATER STREET, BOSTON, MA 021094280, US	GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes
5553043	08358073	09/03/96	12/15/94	130 WATER STREET, BOSTON, MA 021094280, US	DIKE, BRONSTEIN, ROBERTS AND CUSHMAN, BRIAN	Yes
5556639	08090111	09/17/96	07/13/93	130 WATER STREET, BOSTON, MA 021094280, US	GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes
5559156	08335990	09/24/96	11/08/94	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, & CUSHMAN	Yes
5561164	08104034	10/01/96	08/05/93	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes
5564516	08393211	10/15/96	02/23/95	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
5589942	07505722	12/31/96	04/05/90	130 WATER STREET, BOSTON, MA 021094280, US	PETER J. MANUS, ESQ., DIKE, BRONSTEIN,	Yes
5601141	07959775	02/11/97	10/13/92	130 WATER STREET, BOSTON, MA 021094280, US	PETER J. MANUS, ESQ.,	Yes
5608751	08209963	03/04/97	03/14/94	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
5628726	08389928	05/13/97	02/16/95	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes
5665570	08384545	09/09/97	02/07/95	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
5678926	08353102	10/21/97	12/09/94	130 WATER STREET, BOSTON, MA 021094280, US	ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes
5763284	08428733	06/09/98	04/25/95	130 WATER STREET, BOSTON, MA 021094280, US	PETER F. CORLESS, DIKE, BRONSTEIN, ROBERTS &	Yes
5782962	08706076	07/21/98	08/30/96	130 WATER STREET, BOSTON, MA 021094280, US	GEORGE W. NEUNER, DIKE, BRONSTEIN, ROBERTS	Yes
5840976	08724036	11/24/98	09/23/96	130 WATER STREET, BOSTON, MA 021094280, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes
5844141	08758488	12/01/98	11/29/96	130 WATER STREET, BOSTON, MA 021094280, US	MILTON OLIVER, DIKE, BRONSTEIN, ROBERTS AND	Yes
5858847	08455708	01/05/99	05/31/95	130 WATER STREET, BOSTON, MA 021094280, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes
5985935	08302726	11/16/99	11/01/94	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
6018812	07600204	06/12/01	10/17/90	130 WATER STREET, BOSTON, MA 021094280, US	PETER J. MANUS, DIKE, BRONSTEIN, ROBERTS &	Yes
6248469	09375574	06/12/01	08/17/99	130 WATER STREET, BOSTON, MA 021094280, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes
6248469	09261349	06/19/01	03/03/99	130 WATER STREET, BOSTON, MA 021094280, US	CHRISTINE C. O'DAY, DIKE, BRONSTEIN, ROBERTS &	Yes
6309839	08436518	10/30/01	01/09/99	130 WATER STREET, BOSTON, MA 021094280, US	GREGORY D. WILLIAMS, DIKE, BRONSTEIN	Yes
	08116291		09/03/99	130 WATER STREET, BOSTON, MA 021094280, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes
	60029003		10/23/96	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes
	28004726	03/21/95	02/11/93	130 WATER STREET, BOSTON, MA 021094280, US	KEVIN J. FOURNIER, DIKE, BRONSTEIN, ROBERTS	Yes
	28024396	06/29/95	06/14/94	130 WATER STREET, BOSTON, MA 021094280, US	DONALD BROWN, DIKE, BRONSTEIN, ROBERTS &	Yes
	29010703	03/12/96	07/15/93	130 WATER STREET, BOSTON, MA 021094280, US	ERNEST V. LINEK, DIKE, BRONSTEIN, ROBERTS &	Yes
	29003655	08/06/96	01/12/93	130 WATER STREET, BOSTON, MA 021094280, US	PETER J. MANUS, DIKE, BRONSTEIN, ROBERTS &	Yes
	29096664	10/12/99	11/18/98	130 WATER STREET, BOSTON, MA 021094280, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
	076304778	07/20/93	10/26/90	130 WATER STREET, BOSTON, MA 02110, US	Dike Bronstein, Roberts & Cushman, Edwards & Angell	Yes
	09626234		07/26/01	130 Water Street, Boston, MA 02209, US	Dike, Bronstein, Roberts & Cushman	Yes
	09929405		08/14/01	130 Water Street, Boston, MA 02209, US	David G. Conlin, Dike Bronstein Roberts & Cushman	Yes
	10009683		12/10/01	130 Water Street, Boston, MA 02209, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes
	60238716		10/06/00	130 Water Street, Edwards & Angell Intellectual Property	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
	07662120	11/24/92	02/28/91	130 WATER STREET, BOSTON, MA 02109, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
	07425236	12/22/92	10/17/99	130 WATER STREET, BOSTON, MA 02109, US	DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS &	Yes
	08882646	06/22/99	06/25/97	130 WATER STREET, BOSTON, MA 02109, US	DAVID G. CONLIN	Yes
	08750737	10/24/00	09/13/99	130 WATER STREET, BOSTON, MA 02109, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes
	093021591	08/28/01	06/08/99	130 WATER STREET, BOSTON, MA 02109, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN LLP	Yes
	09033777	11/28/95	03/19/93	BOSTON, MA 02109, US	DIKE, BRONSTEIN, ROBERTS & CUSHMAN, 130	Yes
	0866028	11/14/95	05/20/92	BOSTON, LMA 02109	DONALD BROWN, 130 WATER ST.	Yes
	08707015	02/02/88	08/28/85	BOSTON, MA 02109, US	PAHL, LORUSSO & LOUD, 60 STATE ST.	Yes
	08608177	05/03/88	09/17/86	BOSTON, MA 02109, US	HENRY D. PAHL, JR., ESQ., 60 STATE ST.	Yes
	07050780	07/12/88	05/18/87	BOSTON, MA 02109, US	HENRY D. PAHL, JR., ATTORNEY AT LAW, 80 STATE	Yes
	07132175	03/07/89	12/14/87	BOSTON, MA 02109, US	ROBERT L. GOLDBERG, 130 WATER STREET	Yes
	07135602	06/20/89	12/21/87	BOSTON, MA 02109, US	HENRY D. PAHL, JR., ATTORNEY AT LAW, 60 STATE	Yes
	07134775	12/05/89	12/17/87	BOSTON, MA 02109, US	DIKE, BRONSTEIN, ROBERTS, CUSHMAN, & PFUND,	Yes
	07113879	12/19/89	10/27/87	BOSTON, MA 02109, US	DONALD BROWN, 130 WATER STREET	Yes



44897165	07235051	0273090	0823248	BOSTON, MA	02109	US
44905091	07118217	0227590	1106287	BOSTON, MA	02109	US
44917777	07147864	0477190	0712588	BOSTON, MA	02109	US
44932518	07438021	0641290	1152049	BOSTON, MA	02109	US
50200212	07528872	0604091	0529090	BOSTON, MA	02109	US
50305050	07574487	0709091	0822890	BOSTON, MA	02109	US
50357659	07532137	0806091	0765090	BOSTON, MA	02109	US
50424281	07471408	0827091	0722990	BOSTON, MA	02109	US
50438111	07536723	0827091	061290	BOSTON, MA	02109	US
50533318	07333770	1000191	0571808	BOSTON, MA	02109	US
50650505	07596066	1119091	1001090	BOSTON, MA	02109	US
50847426	07622891	0128092	1214490	BOSTON, MA	02109	US
50931144	07622396	0303092	1143090	BOSTON, MA	02109	US
51133842	07514701	0501992	042690	BOSTON, MA	02109	US
51179198	07376828	0112993	0707089	BOSTON, MA	02109	US
51219192	07309897	0616092	1122090	BOSTON, MA	02109	US
51247479	07601245	0662392	1017790	BOSTON, MA	02109	US
5128232	07354800	0707092	0532288	BOSTON, MA	02109	US
5147786	07627326	0905092	1202091	BOSTON, MA	02109	US
5154480	07622137	0915092	1203090	BOSTON, MA	02109	US
5153222	07715439	1006092	0851491	BOSTON, MA	02109	US
5179198	07376828	0112993	0707089	BOSTON, MA	02109	US
51913176	07364579	0302093	1029091	BOSTON, MA	02109	US
5201588	07657769	0471993	0326092	BOSTON, MA	02109	US
5204765	07822300	0422093	0161792	BOSTON, MA	02109	US
5206268	07394224	0427093	0615089	BOSTON, MA	02109	US
5209753	07679005	0511993	0628091	BOSTON, MA	02109	US
5212006	07815113	0518093	1232791	BOSTON, MA	02109	US
52139317	07848880	0525093	1313191	BOSTON, MA	02109	US
5224068	07638076	0662993	0700791	BOSTON, MA	02109	US
5226595	07831209	0706093	0207092	BOSTON, MA	02109	US
5227959	07755709	0701393	0805091	BOSTON, MA	02109	US
5230766	07845000	0702793	0227892	BOSTON, MA	02109	US
5238776	07661125	0824993	0227091	BOSTON, MA	02109	US
5241107	06798125	0831093	111408	BOSTON, MA	02109	US
5245857	07829406	0901493	1313192	BOSTON, MA	02109	US
5246658	07664053	0921993	0304091	BOSTON, MA	02109	US
5253163	07530828	1001293	0653090	BOSTON, MA	02109	US
526640	08024799	1130093	0303109	BOSTON, MA	02109	US
5272537	07738317	1122193	0731091	BOSTON, MA	02109	US
5276290	07943067	0100494	0901092	BOSTON, MA	02109	US
5280374	07843966	0118194	0228092	BOSTON, MA	02109	US
5281531	07844285	0125094	0228092	BOSTON, MA	02109	US
5283367	07843881	0308094	0227092	BOSTON, MA	02109	US
5283356	077741932	0308094	0808091	BOSTON, MA	02109	US
5297820	07955139	0329094	1009092	BOSTON, MA	02109	US
5300945	07866100	0405094	0601092	BOSTON, MA	02109	US
5306109	07938158	0426094	1130092	BOSTON, MA	02109	US
5306063	08065166	0426094	0520093	BOSTON, MA	02109	US
5310423	07931813	0510094	0722092	BOSTON, MA	02109	US
5311270	08071758	0510094	0609093	BOSTON, MA	02109	US

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5314663	05/01/2588	05/24/94	02/03/93	BOSTON	MA	02/109	US
53171430	07/98/1632	05/31/94	12/09/92	BOSTON	MA	02/109	US
5321431	07/79/9370	06/14/94	11/27/91	BOSTON	MA	02/109	US
5321536	07/96/91/04	06/14/94	10/30/92	BOSTON	MA	02/109	US
5331625	07/94/964	07/19/94	09/17/92	BOSTON	MA	02/109	US
5336161	07/98/3417	08/09/94	11/30/92	BOSTON	MA	02/109	US
5343282	08/09/97/39	08/30/94	07/20/93	BOSTON	MA	02/109	US
5353659	07/83/7787	10/04/94	02/14/92	BOSTON	MA	02/109	US
5356311	08/03/7979	10/18/94	03/25/93	BOSTON	MA	02/109	US
5357266	07/84/97/33	10/18/94	03/11/92	BOSTON	MA	02/109	US
5362600	08/07/8654	11/08/94	05/25/93	BOSTON	MA	02/109	US
5366846	08/08/2428	11/22/94	06/28/93	BOSTON	MA	02/109	US
5370980	08/11/7585	12/06/94	09/08/93	BOSTON	MA	02/109	US
5371745	07/52/5092	12/06/94	05/17/90	BOSTON	MA	02/109	US
5376134	08/12/3273	12/27/94	12/23/93	BOSTON	MA	02/109	US
5377889	08/11/5500	01/03/95	09/01/93	BOSTON	MA	02/109	US
5382600	08/00/7769	07/24/95	07/12/93	BOSTON	MA	02/109	US
5386368	08/06/6612	07/31/95	05/03/93	BOSTON	MA	02/109	US
5389389	07/65/373	02/28/95	09/25/91	BOSTON	MA	02/109	US
5396090	08/19/5756	03/07/95	02/14/94	BOSTON	MA	02/109	US
5396121	08/13/9552	03/07/95	10/20/93	BOSTON	MA	02/109	US
5400048	08/11/0859	03/21/95	11/23/93	BOSTON	MA	02/109	US
5400399	08/07/2599	04/25/95	05/21/93	BOSTON	MA	02/109	US
5401158	08/09/2763	03/32/195	07/23/93	BOSTON	MA	02/109	US
5416754	07/99/5367	05/16/95	12/23/92	BOSTON	MA	02/109	US
5418547	08/19/9465	05/23/95	02/22/94	BOSTON	MA	02/109	US
54222825	08/06/7461	06/06/95	05/26/93	BOSTON	MA	02/109	US
5423610	08/14/2184	06/13/95	10/26/93	BOSTON	MA	02/109	US
5428919	08/08/8773	06/27/95	05/07/93	BOSTON	MA	02/109	US
5430462	08/16/3300	07/04/95	12/06/93	BOSTON	MA	02/109	US
5430504	07/92/3222	07/04/95	07/31/92	BOSTON	MA	02/109	US
5434659	08/28/8423	07/18/95	08/10/94	BOSTON	MA	02/109	US
5437814	08/23/3408	08/01/95	04/26/94	BOSTON	MA	02/109	US
5438651	08/32/9690	08/01/95	10/26/94	BOSTON	MA	02/109	US
5441770	07/74/7483	08/15/95	08/14/91	BOSTON	MA	02/109	US
5441978	08/01/2569	08/15/95	02/03/93	BOSTON	MA	02/109	US
5443467	08/19/8849	08/22/95	02/18/94	BOSTON	MA	02/109	US
5446174	08/01/3038	08/29/95	02/03/93	BOSTON	MA	02/109	US
5447119	08/01/2280	09/05/95	09/27/93	BOSTON	MA	02/109	US
54473460	08/05/4454	12/05/95	04/27/93	BOSTON	MA	02/109	US
5447884	08/03/6731	12/26/95	09/15/94	BOSTON	MA	02/109	US
5481273	08/21/3932	10/02/96	07/12/94	BOSTON	MA	02/109	US
5486412	07/92/4054	01/23/96	03/15/91	BOSTON	MA	02/109	US
5486859	08/14/1850	02/13/96	11/03/93	BOSTON	MA	02/109	US
5490882	08/28/3123	02/13/96	08/19/94	BOSTON	MA	02/109	US
5494746	08/22/7580	02/27/96	04/14/94	BOSTON	MA	02/109	US
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5574185	083346605	1112966	1116194	BOSTON	MA	02109	US
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5595402	08452367	1211796	0526395	BOSTON	MA	02109	US
5595936	08454579	0204497	0504095	BOSTON	MA	02109	US
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5641654	08081072	0624497	0622293	BOSTON	MA	02109	US
5645160	08466042	0708097	0606365	BOSTON	MA	02109	US
5647931	083075156	0715197	0822295	BOSTON	MA	02109	US
5665501	086302222	0890497	0442496	BOSTON	MA	02109	US
5668671	086302818	0916197	0903094	BOSTON	MA	02109	US
5672176	08611991	0930597	0303096	BOSTON	MA	02109	US
5676640	086226567	1101497	0326395	BOSTON	MA	02109	US
5677194	08624651	1101497	0416195	BOSTON	MA	02109	US
5681319	086807681	102897	0226395	BOSTON	MA	02109	US
5702451	08681149	1235097	1212995	BOSTON	MA	02109	US
5712391	09671001	0127198	0628296	BOSTON	MA	02109	US
5716580	084565097	0210198	0627565	BOSTON	MA	02109	US
5725852	085289997	0310198	0912395	BOSTON	MA	02109	US
5728174	085326257	0317198	1100395	BOSTON	MA	02109	US
5730925	086341171	0537398	0418196	BOSTON	MA	02109	US
5753374	08622008	0611998	0326395	BOSTON	MA	02109	US
5753319	08400978	0541998	0308095	BOSTON	MA	02109	US
5768894	08571906	0623298	1219195	BOSTON	MA	02109	US
5767227	08408222	0707098	0322295	BOSTON	MA	02109	US
5844007	08415557	1232998	0607565	BOSTON	MA	02109	US
584767	08809902	0302099	0213998	BOSTON	MA	02109	US
5925001	082528820	0720299	0411194	BOSTON	MA	02109	US
5942231	08684920	0824299	0618196	BOSTON	MA	02109	US
5952306	07191543	08914199	0724292	BOSTON	MA	02109	US
595491	084635352	0927199	0627395	BOSTON	MA	02109	US
5962570	08574391	1100599	1213396	BOSTON	MA	02109	US
5981502	08716333	1105999	1214195	BOSTON	MA	02109	US
5986974	086202825	0402400	0322296	BOSTON	MA	02109	US
6045790	079393556	0410490	0907192	BOSTON	MA	02109	US
6060556	086853868	0627200	0309398	BOSTON	MA	02109	US
611576	08552554	0109071	1103395	BOSTON	MA	02109	US
6216509	077553342	0417101	0911081	BOSTON	MA	02109	US
	07323040		0310189	BOSTON	MA	02109	US
	07371383		0626395	BOSTON	MA	02109	US
	07519280	0405090	0706390	BOSTON	MA	02109	US
	07549400		0910190	BOSTON	MA	02109	US
	07580105		0911290	BOSTON	MA	02109	US
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09672071		09/28/00	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	Peter F. Corless, EDWARDS & ANGELL, LLP	Yes	Yes
09733815		03/30/01	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	John J. Pikorski, c/o EDWARDS & ANGELL, LLP	Yes	Yes
09734392		12/11/00	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	Peter F. Corless, EDWARDS & ANGELL, LLP	Yes	Yes
09781462		02/12/01	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	S. Matthew Cairns, c/o EDWARDS & ANGELL, LLP	Yes	Yes
09794663		02/26/01	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	S. Matthew Cairns, c/o EDWARDS & ANGELL, LLP	Yes	Yes
09819348		03/27/01	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	Peter F. Corless, EDWARDS & ANGELL, LLP	Yes	Yes
09958990		11/28/01	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	John J. Pikorski, c/o EDWARDS & ANGELL, LLP	Yes	Yes
09632736		08/04/00	Dike, Bronstein, Roberts & Cushman, IP Group, 130 Water	S. Matthew Cairns, c/o EDWARDS & ANGELL, LLP	Yes	Yes
10015867		12/21/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
10169012		06/22/02	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
10125038		04/18/02	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09653509	03/19/02	08/09/00	Edward & Angel LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09653774		08/11/00	Edward & Angel LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09704908		11/02/00	Edward & Angel LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09706359		11/03/00	EDWARDS & ANGELL LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09718174		11/17/00	EDWARDS & ANGELL LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09756649		01/03/01	EDWARDS & ANGELL LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09819279		07/19/00	Edward & Angel LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09671534	07/09/02	09/27/00	Edward & Angel LLP, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09622753	03/26/02	08/21/00	Edward & Angel, 130 Water Street, Boston, MA 02109, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
09622006		11/20/00	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09655003		09/11/00	EDWARDS & ANGELL, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09701284		08/08/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Dike Bronstein Roberts & Cushman, Intellectual	Yes	Yes
09719278		02/08/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09806287		03/28/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09857119		10/01/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman IP	Yes	Yes
09914236		08/22/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09807655		11/01/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
10019265		11/13/01	Edward & Angel, 130 Water Street, Boston, MA 02109, US	William J. Daley Jr, Dike Bronstein Roberts & Cushman	Yes	Yes
10049668		02/13/02	Edward & Angel, 130 Water Street, Boston, MA 02109, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
10049969		02/13/02	Edward & Angel, 130 Water Street, Boston, MA 02109, US	George W. Neuner, Dike Bronstein Roberts & Cushman	Yes	Yes
10168394		06/19/02	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
10168395		06/19/02	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09600562		10/23/00	Edward & Angel, 130 Water Street, Boston, MA 02109, US	Peter F. Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
09601895		09/22/00	Edward & Angel, 130 Water Street, Boston, MA 02109, US	David G. Conlin, Dike Bronstein Roberts & Cushman	Yes	Yes
10029363		12/20/01	EDWARDS & ANGELL, LLP, 130 WATER STREET, BOSTON,	Lisa Swiszc, Hazzard, Dike Bronstein Roberts & Cushman	Yes	Yes
0953554.1	11/13/01	03/27/00	EDWARDS & ANGELL, LLP, 130 WATER STREET, BOSTON,	David G. Conlin, Dike Bronstein, Roberts & Cushman	Yes	Yes
6320378	09822646	11/20/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	GEORGE W. NEUNER, DIKE BRONSTEIN ROBERTS	Yes	Yes
6346813	09748765	02/19/02	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
6355910	09733835	03/12/02	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
6456667	09783525	02/14/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09657825		09/08/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	DIKE, BRONSTEIN, ROBERTS & CUSHMAN,	Yes	Yes
09711161		11/12/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09715715		11/17/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09717937		11/21/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09721182		11/22/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09747913		12/22/00	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09749193		12/22/00	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09748502		12/26/00	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09750894		01/03/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09759914		01/12/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09764676		01/18/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09768931		01/24/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09776311		02/02/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09781862		02/12/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
09788967		02/11/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA	DIKE, BRONSTEIN, ROBERTS & CUSHMAN,	Yes	Yes
09790486		02/22/01	Edward & Angel, LLP, 130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes

09791416	02/23/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman, LLP	Intellectual	Yes	Yes
09792350	02/23/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09796571	02/28/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09800082	03/05/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09802821	03/09/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	David G. Conlin, Dike, Bronstein, Roberts & Cushman		Yes	Yes
09803562	03/09/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09809644	03/15/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09809749	03/15/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09812115	03/14/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09820021	03/28/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	David G. Conlin, Esq., Dike, Bronstein, Roberts & Cushman		Yes	Yes
09821779	03/28/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09822681	03/30/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	George W. Neuner, Dike, Bronstein, Roberts & Cushman		Yes	Yes
09824549	04/02/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09825442	04/03/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09832393	04/10/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09832525	04/11/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09835194	04/13/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09841656	04/24/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09847055	05/01/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09854434	05/11/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09860656	05/18/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09864857	05/23/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
098680823	06/14/01	EDWARDS & ANGELL, LLP	130 Water Street, Boston, MA 02109,	Peter F. Corless, Dike, Bronstein, Roberts & Cushman,		Yes	Yes
09884414	06/19/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09891060	06/25/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09905719	07/13/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
099030313	07/17/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
099202384	08/01/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
09975874	10/12/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	David G. Conlin, Dike, Bronstein, Roberts & Cushman		Yes	Yes
09994539	11/27/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
100027114	12/20/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	David G. Conlin, Esq., Dike, Bronstein, Roberts & Cushman		Yes	Yes
10034290	12/21/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10034545	12/21/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dick, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10034558	01/04/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10037698	11/09/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10039309	11/07/01	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	David G. Conlin, Esq., Dike, Bronstein, Roberts & Cushman		Yes	Yes
10058341	01/28/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10068146	02/06/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10068150	02/06/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10096837	03/15/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
10102794	03/21/02	Edwards & Angel, LLP	130 Water Street, Boston, MA 02109,	Dike, Bronstein, Roberts & Cushman	Intellectual	Yes	Yes
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09728806	11/29/00	Edwards & Angel, LLP, 130 Water Street, Boston, MA 02109,
09758906	01/11/01	Edwards & Angel, LLP, 130 Water Street, Boston, MA 02109,
09809907	03/16/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09765796	11/06/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09798397	02/01/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09752102	03/02/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09834313	12/29/00	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09803356	04/13/01	EDWARDS & ANGELL, LLP, 130 Water Street, Boston, MA
09812817	03/20/01	Intellectual Property Patent Practice, 130 Water Street, Boston,
09815257	03/22/01	Intellectual Property Practice Group, 130 Water Street, Boston,
09830646	04/27/01	Intellectual Property Practice Group, 130 Water Street, Boston,
10049305	02/06/02	Intellectual Property Practice Group, 130 Water Street, Boston,
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09822268	03/30/01	Intellectual Property Practice Group, 130 Water Street, Boston,
10063968	02/20/02	Intellectual Property Practice Group, 130 Water Street, Boston,
09830706	08/07/01	Intellectual Property Practice Group, 130 Water Street, Boston,
09769911	01/25/01	Intl. Prop. Practice Group, Edwards & Angel, LLP, 130 Water
09860107	07/18/02	IP Group of Edwards & Angel, 130 Water Street, Boston, MA
10070511	03/05/02	IP Group of Edwards & Angel, 130 Water Street, Boston, MA
09918399	07/30/01	IP Group of EDWARDS & ANGELL, LLP, 130 Water Street,
09961808	09/24/01	IP Group of EDWARDS & ANGELL, LLP, 130 Water Street,
10190292	07/03/02	P. O. Box 9169, Marlborough, MA 01752, US
47511106	06/14/88	PFUND, 130 WATER ST., BOSTON, MA 02109, US
47453600	06450561	PFUND, 130 WATER ST., BOSTON, MA 02109, US
4582188	06604923	PFUND, 130 WATER ST., BOSTON, MA 02109, US
4764191	07104275	PFUND, 130 WATER ST., BOSTON, MA 02109, US
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4952319	07245397	PFUND, 130 WATER ST., BOSTON, MA 02109, US
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4871826	07065224	PFUND, 130 WATER STREET, BOSTON, MA 02109, US
4877050	07264336	PFUND, 130 WATER STREET, BOSTON, MA 02109, US
4907232	07074747	PFUND, 130 WATER STREET, BOSTON, MA 02109, US
4956740	07081645	PFUND, 130 WATER STREET, BOSTON, MA 02109, US
5008249	06689985	PFUND, 130 WATER STREET, BOSTON, MA 02109, US
4902610	07054102	PFUND, 130 WATER ST., BOSTON, MA 02109, US
5210871	07361362	ROBERT L. GOLDBERG, 130 WATER STREET, BOSTON, MA
	05/11/93	ROBERTS & CUSHMAN, 130 WATER STREET, BOSTON, MA
	07/31/90	

Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
Dike, Bronstein, Roberts & Cushman, LLP, Intellectual	Yes	Yes
Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	No
Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
Dike, Bronstein, Roberts & Cushman, Intellectual	Yes	Yes
EDWARDS & ANGELL, LLP, Dike, Bronstein, Roberts &	Yes	Yes
EDWARDS & ANGELL, LLP, Dike, Bronstein, Roberts &	Yes	Yes
Edwards & Angell, LLP, Dike, Bronstein, Roberts &	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman,	Yes	Yes
George W Neuner, Dike Bronstein Roberts & Cushman,	Yes	Yes
Edwards & Angell LLP, Dike, Bronstein, Roberts &	Yes	Yes
DIKE, BRONSTEIN, ROBERTS & CUSHMAN,	Yes	Yes
EDWARDS & ANGELL, LLP, Dike, Bronstein, Roberts &	Yes	Yes
George W Neuner Edward & Angell, Dike Bronstein	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
David G. Conlin, Dike, Bronstein, Roberts & Cushman	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F Corless, Dike Bronstein Roberts & Cushman	Yes	Yes
Peter F. Corless, c/o Dike, Bronstein, Roberts &	Yes	Yes
S. Matthew Cairns, c/o Dike, Bronstein, Roberts &	Yes	Yes
S. Matthew Cairns, c/o Bronstein, Robert & Cushman,	Yes	Yes
ROBERT L. GOLDBERG, ESQ., DIKE, BRONSTEIN,	Yes	Yes
ROBERT I. GOLDBERG, ESQ., DIKE, BRONSTEIN,	Yes	Yes
GEORGE W. NEUNER, ESQ., DIKE, BRONSTEIN,	Yes	Yes
ROBERT T. GAMMONS, ESQ., DIKE, BRONSTEIN,	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
ROBERT M. ASHER, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
DAVID G. CONLIN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
ROBERT T. GAMMONS, DIKE, BRONSTEIN,	Yes	Yes
GEORGE W. NEUNER, DIKE, BRONSTEIN,	Yes	Yes
ROBERT T. GAMMONS, DIKE, BRONSTEIN,	Yes	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes
DONALD BROWN, DIKE, BRONSTEIN, ROBERTS,	Yes	Yes
ATTN: DAVID G. CONLIN, ESQ., DIKE, BRONSTEIN,	Yes	Yes
DIKE, BRONSTEIN, ROBERTS & CUSHMAN	Yes	Yes
ROBERT F. O'CONNELL, DIKE, BRONSTEIN,	Yes	Yes

**COPY**

**Practitioner's Docket No. 55,750 (45672)**  
**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: T. Adachi, et al.  
Application No.: 09/820021 Group No.: Unassigned  
Filed: March 28, 2001 Examiner: Unassigned  
For: LIQUID CRYSTAL DISPLAY DEVICE

**Assistant Commissioner for Patents**  
**Washington, D.C. 20231**

**TRANSMITTAL OF CERTIFIED COPY**

Attached please find the certified copy of the foreign application from which priority is claimed for this case:

Country: Japan  
Application No: 2000-091832  
Filing Date: 3/29/2000

Country: Japan  
Application No. 2000-096765  
Filing Date 3/31/2000

Country: Japan  
Application No. 2001-032773  
Filing Date 2/8/2001

Country: Japan  
Application No. 2001-038246  
Filing Date 2/15/2001

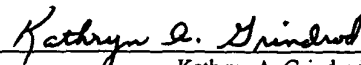
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**CERTIFICATE OF MAILING (37 C.F.R. 1.8a)**

I hereby certify that this correspondence is, on the date shown below, being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Date: May 7, 2001

Signature

  
Kathryn A. Grindrod

T. Adachi, et al.  
USSN: 09/820021  
Page 2

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Customer No.: 21874

Dike, Bronstein, Roberts & Cushman  
Intellectual Property Practice Group  
EDWARDS & ANGELL, LLP  
P.O. Box 9169  
Boston, MA 02209  
Tel. No.: (617) 523-3400  
164172

David A. Tucker  
**SIGNATURE OF PRACTITIONER**  
David A. Tucker  
Reg. No. 27,840

日本国特許庁  
PATENT OFFICE  
JAPANESE GOVERNMENT

COPY

別紙添付の書類に記載されている事項は下記の出願書類に記載されて  
いる事項と同一であることを証明する。  
This is to certify that the annexed is a true copy of the following application as filed  
with this Office.

出願年月日  
Date of Application:

2000年 3月29日

出願番号  
Application Number:

特願2000-091832

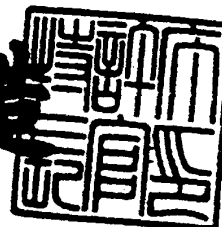
出願人  
Applicant(s):

シャープ株式会社

2001年 1月12日

特許庁長官  
Commissioner,  
Patent Office

及川耕造



出証番号 出証特2000-3111577



日本国特許庁

PATENT OFFICE  
JAPANESE GOVERNMENT

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別紙添付の書類に記載されている事項は下記の出願書類に記載されて  
いる事項と同一であることを証明する。

This is to certify that the annexed is a true copy of the following application as filed  
with this Office.

出願年月日  
Date of Application:

2000年 3月31日

出願番号  
Application Number:

特願2000-096765

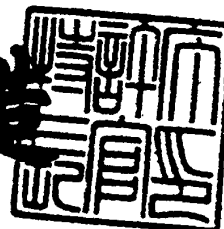
出願人  
Applicant(s):

シャープ株式会社

2001年 1月12日

特許庁長官  
Commissioner,  
Patent Office

及川耕造



出証番号 出証特2000-3111578

日本国特許庁  
PATENT OFFICE  
JAPANESE GOVERNMENT

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別紙添付の書類に記載されている事項は下記の出願書類に記載されて  
る事項と同一であることを証明する。

This is to certify that the annexed is a true copy of the following application as filed  
with this Office.

出願年月日  
Date of Application:

2001年 2月 8日

願番号  
Application Number:

特願2001-032773

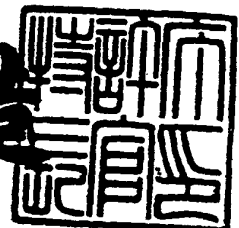
願人  
Applicant(s):

シャープ株式会社

2001年 3月 9日

特許庁長官  
Commissioner,  
Patent Office

及川耕造



出証番号 出証特2001-3016361

日本国特許庁  
PATENT OFFICE  
JAPANESE GOVERNMENT

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別紙添付の書類に記載されている事項は下記の出願書類に記載されている事項と同一であることを証明する。

This is to certify that the annexed is a true copy of the following application as filed with this Office.

出願年月日  
Date of Application:

2001年 2月15日

出願番号  
Application Number:

特願2001-038246

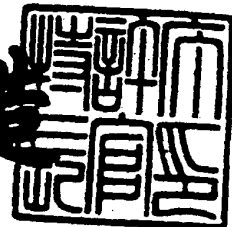
出願人  
Applicant(s):

シャープ株式会社

2001年 3月16日

特許庁長官  
Commissioner,  
Patent Office

及川耕造



出証番号 出証特2001-3018443

COPY

Attorney Docket No. 55,750 (45672)

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

APPLICANT: T. Adachi, et al.

U.S.S.N.: Unassigned

Art Unit: Unassigned

FILED: Herewith

Examiner: Unassigned

FOR: LIQUID CRYSTAL DISPLAY DEVICE

.....  
**CERTIFICATE OF EXPRESS MAILING**

I hereby certify that this correspondence is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 (Express Mail Label No. EL730721694US), and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231. on March 28, 2001

By: 

Donna M. Pomase  
.....

**INFORMATION DISCLOSURE STATEMENT  
(SUBMISSION AFTER FILING OF AN APPLICATION  
BUT BEFORE FINAL REJECTION OR NOTICE OF ALLOWANCE)**

---

Assistant Commissioner for Patents  
Washington, D.C. 20231

Date: March 28, 2001

Sir:

Pursuant to 37 C.F.R. §§ 1.97 and 1.98, Applicant(s) hereby submit(s) an Information Disclosure Statement for consideration by the Examiner.

I. **LIST OF PATENTS, PUBLICATIONS OR OTHER INFORMATION**

The patents, publications or other information submitted for consideration by the Office are listed on PTO-1449, attached hereto.

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II. COPIES

- a. X Submitted herewith is a legible copy of (i) each U.S and foreign patent; (ii) each publication or that portion which caused it to be listed; and (iii) all other information or that portion which caused it to be listed.
- b.      Each of the patents, publications or other information listed on the attached PTO-1449 was previously cited by or submitted to the USPTO in connection with U.S.S.N.: 08/000,000, to which the subject application claims the benefit of the earlier filing date. As such, a copy of each is not included herewith pursuant to 37 C.F.R. § 1.98(d).

III. CONCISE EXPLANATION OF THE RELEVANCE

(check at least one box)

- a. X Except as may be indicated below in (b), all of the patents, publications or other information are in the English language or were cited in an English language Search Report, a copy of which is attached hereto (concise explanation not required).
- b. X A concise explanation of the relevance of all patents, publications or other information listed that is not in the English language is as follows:

     English translation for reference(s)         .

X English abstract for reference(s) BA.

     English translation of search report/ official communication.

     Copy of PCT/EPO Search Report.

Reference BA also referred to in background of subject application.

- c.      The following additional information is provided for the Examiner's consideration:

     Copy of EPO Search Report.

     Copy of PCT Search Report.

     Copy of Official Communication from the          Patent Office.

     English translation of search report/ official communication.

     Copy of         .

COPY

**FEES**

IV. THIS IDS IS BEING FILED UNDER 37 C.F.R. § 1.97(b)  
(check one box)

- a. X within three months of the filing date of a national application (37 C.F.R. § 1.97(b) (1)). No fee or certification is required.
- b. \_\_\_\_\_ within three months of the date of entry of the national stage as set forth in §1.491 in an international application (37 C.F.R. § 1.97(b) (2)). No fee or certification is required.
- c. \_\_\_\_\_ before the mailing date of a first Action on the merits (37 C.F.R. § 1.97(b) (3)). No fee or certification is required. In the event that a first Office Action on the merits has been issued, please consider this IDS under 37 C.F.R. § 1.97(c) and see the certification under 37 C.F.R. § 1.97(e) below, or, if no certification has been made, charge our deposit account a fee in the amount of \$230.00 as required by 37 C.F.R. § 1.17(p).

V. THIS IDS IS BEING FILED UNDER 37 C.F.R. § 1.97(c):  
(check one box)

before the mailing date of a Final Office Action under 37 C.F.R. § 1.113 (See 37 C.F.R. § 1.97(c) (1)) or before the mailing date of a Notice of Allowance under 37 C.F.R. § 1.311 (See 37 C.F.R. § 1.97(e) (2)).

---

- a. \_\_\_\_\_ No certification; therefore, a fee in the amount of \$230.00 is required by 37 C.F.R. § 1.17(p).
- or
- b. \_\_\_\_\_ See the certification below. No fee is required.

COPY

VI. CERTIFICATION UNDER 37 C.F.R. § 1.97(e) (check only one box)

The undersigned hereby certifies that

- a. ☐ each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS; or
- b. ☐ no item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application or, to the best of my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this statement.
- c. ☐ Some of the items of information were cited in a communication from a foreign Patent Office. As to this information, the undersigned certifies that each item of information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application not more than three months prior to the filing of this IDS. As to the remaining information, the undersigned hereby certifies that no item of this remaining information contained in the IDS was cited in a communication from a foreign Patent Office in a counterpart foreign application or, to the best of my knowledge after making reasonable inquiry, was known to any individual designated in 37 C.F.R. § 1.56(c) more than three months prior to the filing of this statement.

---

VII. FEE PAYMENT (check one)

- ☐ Enclosed please find a check in the amount of \$230.00 for the above-indicated fee.
- ☐ Please charge Deposit Account No. 04-1105 in the amount of \$230.00 for the above-indicated fee.
- ☒ No fee is required.

Attorney Docket No. 55,750 (45672)  
T. Adachi, et al.  
Page 5

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If the Examiner has any questions concerning this IDS, he/she is requested to contact the undersigned. If it is determined that this IDS has been filed under the wrong rule, the PTO is requested to consider this IDS under the proper rule, with a petition if necessary, and charge the appropriate fee to Deposit Account No. 04-1105.

Respectfully submitted,

Date: March 28, 2001

David A. Tucker  
David A. Tucker (Reg. No. 27,840)

Dike, Bronstein, Roberts & Cushman  
Intellectual Property Practice Group  
EDWARDS & ANGELL, LLP  
130 Water Street  
Boston, MA 02109  
Telephone: (617) 523-3400

164815

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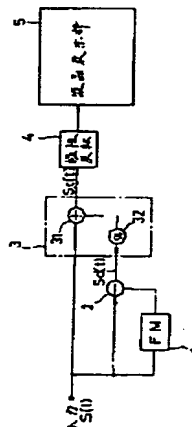
## (54) LIQUID CRYSTAL DISPLAY DEVICE

## (57) Abstract:

**PURPOSE:** To offer the liquid crystal display device equipped with a driving circuit which realize a response speed nearly as fast as or faster than that of a binary display even with a half-tone level.

**CONSTITUTION:** An image storage circuit 1 which holds at least one field image of an input image signal is provided, and a time base filter circuit 3 detects level variation of each picture element in the time-base direction from the image signal held in the storage circuit 1 and the input image signal and performs high-frequency emphasized filtration in the time-base direction of each picture element for the input image signal according to the detection output. Consequently, the response characteristics of the liquid crystal display device are improved, the response speed of a half-tone display is made fast, and high picture quality with a reduced after-image is obtained.

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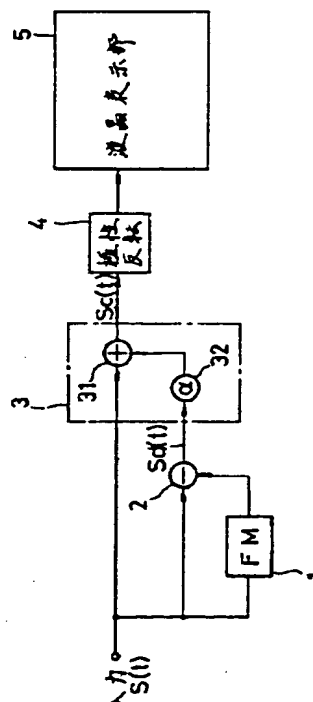
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(54) 【発明の名称】 液晶表示装置

(57) 【要約】

【目的】 中間調レベルでも二値表示なみ若しくはそれ以上の応答速度を実現し得る駆動回路を備えた液晶表示装置を提供することを目的とする。

【構成】 入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路1を備え、この記憶回路1に保持された画像信号と入力画像信号とから各画素の時間軸方向のレベル変動を検出して、その出力に応じて入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路3を設けることにより、液晶表示装置の応答特性を改善し、特に中間調表示での応答速度を高速化して残像を低減した高画質を得る。



## 【特許請求の範囲】

【請求項1】入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路と、この記憶回路に保持された画像信号と前記入力画像信号とから各画素の時間軸方向のレベル変動を検出するレベル変動検出回路と、この検出回路の出力に応じて前記入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路と、この時間軸フィルタ回路の出力信号が供給される液晶表示部と、を備えたことを特徴とする液晶表示装置。

【請求項2】前記時間軸フィルタ回路は、前記レベル変動検出回路の出力と前記入力画像信号の各画素の入力レベルによりフィルタ特性が変化させられる適応型フィルタ回路であることを特徴とする請求項1記載の液晶表示装置。

【請求項3】前記時間軸フィルタ回路は、前記各画素の時間軸方向のレベル変動の極性に応じて異なる特性を持つことを特徴とする請求項1記載の液晶表示装置。

【請求項4】入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路と、この記憶回路に保持された画像信号と前記入力画像信号とから各画素の時間軸方向のレベル変動を検出するレベル変動検出回路と、この検出回路の出力に応じて前記入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路と、この時間軸フィルタ回路の出力信号が供給される液晶表示部と、この液晶表示部の液晶温度を検出して、その検出出力に応じて前記時間軸フィルタの特性を可変制御する液晶温度検出回路と、を備えたことを特徴とする液晶表示装置。

【請求項5】入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路と、この記憶回路に保持された画像信号と前記入力画像信号とから各画素の時間軸方向のレベル変動を検出するレベル変動検出回路と、前記入力画像信号の中で動いている部分を検出する動き検出回路と、前記レベル変動検出回路および動き検出回路の出力に応じて前記入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路と、この時間軸フィルタ回路の出力信号が供給される液晶表示部と、を備えたことを特徴とする液晶表示装置。

【請求項6】入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路と、この記憶回路に保持された画像信号と前記入力画像信号とから各画素の時間軸方向のレベル変動を検出するレベル変動検出回路と、前記入力画像信号の中で動いている部分を検出する動き検出回路と、前記レベル変動検出回路および動き検出回路の出力に応じて前記入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路と、この時間軸フィルタ回路の出力信号が供給される液晶表示部と、この液晶表示部の液晶温度を検出して、その検出出力に応じて前記時間軸フィルタの特性を可変制御す

る液晶温度検出回路と、を備えたことを特徴とする液晶表示装置。

【請求項7】前記液晶温度検出回路は、前記液晶表示部を複数個に分割した小画面毎に温度検出を行い、各小画面の温度検出出力により前記時間軸フィルタの特性を最適制御することを特徴とする請求項4または6に記載の液晶表示装置。

【請求項8】前記入力画像信号の雑音除去を行う雑音除去フィルタが設けられていることを特徴とする請求項1、4、5または6のいずれかに記載の液晶表示装置。

## 【発明の詳細な説明】 【発明の目的】

【0001】

【産業上の利用分野】本発明は、液晶表示装置に係り、とくに中間調表示の応答特性を考慮した駆動回路部の改良に関する。

【0002】

【従来の技術】一般に液晶の応答速度は、液晶分子が印加された電界によって立ち上がる速度  $t_r$  と、電界を零にしたときに各分子間の力によって元の状態に復帰する速度  $t_d$  により決まる。これらの速度  $t_r$ 、 $t_d$  は以下の式で表される。

$$t_r = \eta d^2 / (\Delta \epsilon V - K \pi^2) \quad \dots (1)$$

$$t_d = \eta d^2 / K \pi^2 \quad \dots (2)$$

【0003】ここに、 $K$ は、液晶の発散、ねじれ、曲げの弾性定数をそれぞれ  $K_1$ 、 $K_2$ 、 $K_3$  としたときに、 $K = K_1 + (K_3 - 2K_2) / 4$  で表される定数である。 $\Delta \epsilon$ は、液晶分子の長軸方向の誘電率  $\epsilon_s$  と短軸方向の誘電率  $\epsilon_p$  の差  $\epsilon_s - \epsilon_p$  である。 $\eta$ は液晶分子のねじれ粘性、 $d$ は液晶セルの厚み（セルギャップ）、 $V$ は印加電圧である。

【0004】(1)、(2)式から明らかなように、液晶の応答速度を速めるには、 $\eta$ 、 $d$ を小さくするか、または  $K$ を大きくすればよい。ただし、 $\eta$ 、 $K$ は物質定数であり、 $d$ は屈折率の異方性である  $\Delta n$ との兼ね合いで最小透過率が決まってくるので、それ程小さくすることはできない。そこで種々の液晶物質のブレンドによって  $\eta$ 、 $K$ 、 $\Delta n$ 等を変化させて高速応答を実現する努力が続けられている。また、立ち上がり速度  $t_r$  については、 $\Delta \epsilon$ または  $V$ を変化させることにより高速化することができ、立ち下がり速度  $t_d$  については、誘電率の異方性が低周波では正、高周波では負であることを利用して、電圧OFF時に高周波を重畳して高速化した例が知られている。

【0005】以上のような液晶応答速度の改善は、ON/OFFの二値表示の場合有効であるが、中間調表示を考慮した場合には状況は複雑になる。その事情を図面を参照して以下に説明する。

【0006】図19は電極41、42間の一つの液晶分子43を示している。液晶分子43は、 $x$ 軸に対して  $\theta$ 、 $x$ 軸に対して  $\phi$ 傾いており、この状態で液晶分子4

3にz軸方向の電界がかかったときの流体力学方程式 \*【0007】  
は、 \*【数1】

$$\begin{aligned} r1 \cdot \partial \theta / \partial t = & f(\theta) (\partial^2 \theta / \partial z^2) \\ & + (f(\theta) \partial \theta / \partial z) / \partial z \\ & + g(\theta) (\partial \phi / \partial z)^2 \\ & + e(\theta) (\partial \phi / \partial z) \\ & + h(\theta) Dz^2 / 4\pi \end{aligned} \quad \dots (3)$$

$$r1 \cdot \partial \phi / \partial t = (1/\cos^2 \theta) \cdot (u(\theta)(\partial \theta / \partial z) + v(\theta)) / \partial z \quad \dots (4)$$

【0008】で記述される。上式は非線形偏微分方程式であり、解析的に解くことは出来ないが、数値計算により解くことができる。また電極間に印加される入力電圧※

※Vは、 $a = (\epsilon_s - \epsilon_p) / \epsilon_p$  として、  
【0009】  
【数2】

$$V = (Dz / \epsilon_p) \int_0^d dz / (1 + a \sin^2 \theta) \dots (5)$$

で表される。Dzは電束密度である。

【0010】以上の(3)～(5)式を連立して解くことにより、入力電圧変化による液晶分子の過渡応答特性を求めることができる。これらの式から、液晶分子の時間的变化量は、入力電圧に依存することが分かる。この様にして求められた液晶分子の時間的变化量 $\theta(z, t)$ および $\phi(z, t)$ をBarrmanの4×4マトリクスに入れて解くことにより、最終的な光学応答特性を導出することができる。

【0011】一方、図20は液晶の透過率-入力電圧特性を示している。この特性から、通常、100/1のコントラスト比をとるためには、ノーマリ・ホワイトの場合で5V程度の入力振幅を必要とするが、中間調レベルだけを考えると、振幅は1.5～2Vになる。以上のことは、中間調レベル表示においては、応答速度が二値表示の場合より遅くなることを示している。このことは、液晶をTV等のフルカラー表示に用いた場合問題になる。

【0012】すなわち液晶表示装置をTV等のフルカラー表示に用いる場合、中間調レベルでの応答速度を10msec程度にする必要があるが、現状は三値表示でも20msec程度に止まっている。このため、動画表示には著しく残像が目立ち、高画質が得られない。

【0013】

【発明が解決しようとする課題】以上のように従来の液晶表示装置では、中間調レベルでの応答速度が十分でなく、TV等のフルカラー表示に用いた場合に高画質が得られないという問題があった。

【0014】本発明はこの様な点に鑑みなされたもの

で、中間調レベルでも二値表示なみ若しくはそれ以上の応答速度を実現し得る駆動回路を備えた液晶表示装置を提供することを目的とする。

【発明の構成】

【0015】

【課題を解決するための手段】本発明にかかる液晶表示装置は、入力画像信号の少くとも一枚のフィールド画像を保持する画像用記憶回路を備え、この記憶回路に保持された画像信号と入力画像信号とから各画素の時間軸方向のレベル変動を検出して、その出力に応じて入力画像信号の各画素の時間軸方向に高域強調フィルタをかける時間軸フィルタ回路を設けたことを特徴とする。

【0016】

【作用】本発明によれば、液晶分子の応答速度が遅い場合でも、入力画像信号の高域成分を予め持ち上げるという処理を行って液晶部に供給することにより、応答の立ち上がり、たち下がり的高速化することができる。したがって特に中間調レベルでの応答速度が改善され、TV等のフルカラー表示に用いて高画質を得ることができる。

【0017】

【実施例】以下、本発明の実施例を説明する。

【0018】図1は第1の実施例の要部構成を示す。図の入力画像信号S(t)は、ビデオ信号をR、G、Bに分解した後の信号であるが、R、G、B信号に対して同じ処理になるので、ここではそのうちの1チャンネルのみ示している。入力画像信号S(t)は、少なくとも1フィールド分の画像信号を記憶する画像用記憶回路1に保持される。差分器2は、入力画像信号S(t)と画像用

記憶回路1とから、対応する各画素信号の差をとるもので、1フィールドの間の信号レベルの変化を検出するレベル変化検出回路となっている。この差分器2から得られる時間軸方向の差信号 $S_d(t)$ は、入力画像信号 $S(t)$ と共に時間軸フィルタ回路3に入力される。

【0019】時間軸フィルタ回路3は、差信号 $S_d(t)$ に、応答速度に応じた重み係数 $\alpha$ をかける重み付け回路32と、重み付けられた差信号と入力画像信号 $S(t)$ を加算する加算器31とから構成されている。これはレベル変動検出回路の出力と入力画像信号の各画素の入力レベルによりフィルタ特性が変化させられる適応型フィルタ回路である。この時間軸フィルタ回路3によって入力画像信号 $S(t)$ は時間軸方向の高域が強調される。こうして得られた高域強調信号は、極性反転回路4によって交流信号に変換されて液晶表示部5に供給される。液晶表示部5は、複数本のデータ信号配線とこれと交差する複数本の駆動信号配線の各交差部に表示電極を持つ、アクティブマトリクス方式の液晶表示部である。

【0020】図2はこの実施例により、応答特性が改善される様子を示す信号波形である。説明を分かり易くするため入力画像信号 $S(t)$ が1フィールド周期で変化するものとし、図では2フィールドで信号レベルが急激に変化している場合を示している。この場合時間軸方向の入力信号変化する間差信号 $S_d(t)$ は図に示すように、入力画像信号が正に変化するときに1フィールド間正になり、負に変化するときに1フィールド間負になる。基本的にはこの差信号を入力信号に加えることにより、高域強調ができる。しかしながら実際には、液晶の応答速度によって入力信号変化がどの程度液晶セルの透過率変化になるかが変わってくるので、オーバーシュートが生じない範囲で補正するように重み係数 $\alpha$ をかける。これにより図示のような高域が補正された信号 $S_c(t)$ が得られる。この様に高域が強調される信号が液晶表示部に入力されることにより、光学応答特性 $I(t)$ は、破線で示す従来のものに対して実線で示すように改善される。

【0021】具体的には、図3に示すように液晶の伝達関数を $H_{LCD}(\omega t)$ とすると、高域強調関数 $H_c(\omega t)$ が掛けられた後の周波数特性 $H_t(\omega t)$ は以下のようになる。

$$H_t(\omega t) = H_{LCD}(\omega t) \cdot H_c(\omega t)$$

$$H_c(\omega t)$$

$$= \alpha \{ 1 - \exp(j \cdot 2\pi \omega t / \omega_c) \} + 1$$

$$\omega_c = 2\pi / 60$$

【0022】すなわちこの実施例では、 $H_t(\omega t)$ が広帯域化できるように、 $H_{LCD}(\omega t)$ が低下するところを $H_c(\omega t)$ により補償することになる。実際にこの特性を求め、或いは重み係数 $\alpha$ を決めるためには、従来技術で説明した液晶分子のダイナミック特性を記述す

る式(3)～(5)を $\alpha$ をパラメータとして解いていくことになる。

【0023】図4は第2の実施例の要部構成を示す。なお以下の実施例では図1と対応する部分に図1と同一符号を付して詳細な説明は省略する。従来技術で説明したように液晶の応答速度は、立ち上がりと立ち下がりとは異なるのが通常である。そこで入力の変化が立ち上がり方向の変化であるか、立ち下がり方向の変化であるかを検出して、それぞれの場合で高域強調量を異ならせる方法が考えられる。これを実現したのが第2の実施例である。

【0024】すなわちこの実施例では、二つの重み付け回路321と322を設け、フィールド間差分が正の場合(つまり立ち上がりの時)は、高域強調のための重み係数を $\alpha_1$ 、負の場合(つまり立ち下がりの方)はこれを $\alpha_2$ とする。これらの重み付け回路321、322の出力を切り替え回路33により切り替えて、加算器33に与えるようにしている。

【0025】これにより、図5に示すように、立ち上がりと立ち下がりとは異なるそれぞれ最適の高域強調量を付けた補正信号 $S_c(t)$ を得て、光学応答特性 $I(t)$ をより高速化することができる。

【0026】図6は第3の実施例の要部構成である。図6(a)が第2の実施例と異なる点は、高域強調量を変化させる制御パラメータとして、入力の変化だけでなく、入力レベルそのものをも含めたことである。これは、液晶の応答速度が入力電圧の変化だけでなく、電圧の初期値または変化後の電圧にも依存することを考慮して、より正確な高域補償を行うためである。

【0027】図6(b)は図6(a)をより一般化した実施例である。重み付け回路32の重み係数 $\alpha$ は、入力のフィールド間差分および入力レベルにより変化する。さらに図6(c)に示す実施例は、高域を持ち上げたい部分の周波数を高次のバンドパスフィルタBPF(またはハイパスフィルタHPF)1'により抽出して、その出力と入力レベルにより重み付け回路32の重み係数 $\alpha$ を制御する構成としている。この実施例によると、液晶の応答特性を補償する上でより適した高域強調フィルタとすることができる。

【0028】図7は第4の実施例の要部構成を示す。従来技術で少し説明したが、応答速度はセルギャップの二乗 $d^2$ に反比例している。つまり、セルギャップ $d$ を小さくすれば応答速度は速くなる。しかし、コントラストを高くするためには、 $\Delta n d / \lambda$ ( $\Delta n$ :屈折率の異方性、 $\lambda$ :入力波長)をモーガンの条件を満たすようにしなければならない。したがって最適なコントラストを得るためには、R、G、Bによってセルギャップを変える必要がある。これは、マルチギャップと呼ばれる。この様な場合当然ではあるが、R、G、Bによって応答速度が異なるという問題が生じる。そこでマルチギャップに対応させるべく、R、G、Bでそれぞれ高域強調量を最

適に制御するようにしたのがこの実施例である。ここでは図6(b)の基本回路を3つ用いたが、他の実施例の基本回路3つを用いてもよい。

【0029】図8は第5の実施例の要部構成を示す。この実施例では、図6(b)の実施例の回路に加えて、液晶表示部5の液晶温度を検出する温度検出器6を設け、この温度検出器6の出力により重み付け回路32を制御するようにしている。

【0030】図9に示したように、液晶の応答特性には強い温度依存性があるだけでなく、立上がり立ち下がりとは異なった温度依存性を示す。これは、立上がりは粘性 $\eta$ の温度依存性に大きく影響されるのに対し、立ち下がりには粘性 $\eta$ の温度依存性を分母の弾性定数 $K$ の温度特性が緩和するように働くことに起因している。したがってこの実施例のように、液晶温度を検出してその出力に応じて高域強調パラメータである重み係数 $\alpha$ を変化させるように制御する事により、応答特性の最適補償を行うことが可能になる。

【0031】図10は、液晶の物性定数の温度依存性を示している。図に示すように液晶の物性定数は温度によって変化する。したがってこの物性定数の変化を検出することにより温度検出を行うことができる。同じパネル内の液晶を用いて温度検出ができれば、そのパネルに最も適した温度補償ができる。

【0032】図11は、その様な液晶を用いた液晶温度検出器の構成例である。図10に示したように液晶の誘電率 $\epsilon$ は温度によって変化する。したがって誘電率の変化、つまり液晶容量 $CLCD$ の変化を外づけの容量 $CD$ によって電圧に変換して出力するのが、図11の温度検出原理である。つまり、図11の入出力の関係は、

$$V_{out} = V_{in} \cdot CLCD / (CD + CLCD)$$

と表されるので、液晶容量 $CLCD$ の変化を出力 $V_{out}$ の変化として検出することができる。

【0033】液晶温度検出法としては他に、光検出器を用いて液晶のしきい値 $V_{th}$ の温度による変化を光量変化として検出する方法、マイクロプロセッサを用いてある一定時間毎に立ち上がり、立ち下がり時間を計算し、オーバーシュートのないような制御を常にフィードバックで行う方法等が考えられる。

【0034】図12は、第6の実施例の要部構成である。この実施例では、入力画像信号の動きを検出する動き検出回路8が設けられている。この動き検出回路8により検出された動き量に応じて、フィールド内とフィールド間の補間の重み付け量が決定されると共に、順次走査変換回路7において、時間軸圧縮によりインタレース信号(順次走査信号)に変換される。この順次走査変換された信号が液晶を実際に駆動する信号になるので、この信号が1フィールド期間つまり1画面の信号書き替え周期にどれだけ変化したかが、液晶の応答速度を決める重要なパラメータになる。

【0035】そこで、記憶回路1と差分器2により求まる1フィールド期間内の変化量に入力レベルと動き量に応じて変化する重み係数 $\alpha$ を掛ける重み付け回路32と加算回路31により構成される時間軸強調フィルタによって、順次走査変換信号が補正される。

【0036】図13は、動き検出回路8の具体的な構成例である。輝度信号の動きは、フレームメモリ11の入出力の差を差分器13により検出して、LPF14により1フレーム差分として検出される。色信号の動きはフレームメモリ11とフレーム遅延回路12の直列回路の入出力の差を差分器16により検出して、BPF17により2フレーム差分として検出される。これらの差分信号はそれぞれ絶対値検出回路15、18を通り、最大値検出回路19により最大値が検出される。この最大値検出回路19の出力は伸長回路20を通り、デコーダ21を通過して動き信号として出力される。伸長回路20は、速い動きに対して検出漏れがないように、2フィールドの動き情報を利用して時空間フィルタをかけるために設けられている。

【0037】この様な構成により画像の動きが検出されるわけであるが、誤検出はやはりある。たとえば、静止面のノイズを動画として検出すると、図12の構成ではそのノイズを $\alpha$ 倍してしまうことになる。

【0038】この誤検出を救済するためには、たとえば重み係数 $\alpha$ のテーブルを、図14(a)(b)のように設定することが考えられる。図14(a)に示すように、動き量が小さい時はこれをノイズと判断して、高域強調をかけないようにする。実際に、動き量をフィールド間差分とした場合で、図14(a)の破線のテーブルと実線のテーブルで比較した結果、実線のテーブルの方がノイズが大幅に減少することが確認されている。

【0039】図14(a)のテーブルの場合、画像によっては、不連続点が目立つ可能性がある。したがって図14(b)に示すように段階的に理想の線に近付けるテーブルを用いることも考えられる。

【0040】図15は、図12の実施例において、図8の実施例と同様に液晶温度検出を行って、その出力に応じて高域強調パラメータである重み係数 $\alpha$ を変化させる制御を行うようにした実施例である。

【0041】ところで液晶表示部に場所によって温度ムラがある場合、一点の温度検出では最適温度制御ができない。この様な場合、液晶表示部の複数箇所の温度検出を行うことが有効である。

【0042】図16は、この様な観点から図15を改良した実施例である。この実施例では、液晶表示部5を4分割して、各小画面の4角の温度をスイッチ22により切り替えて検出する。スイッチ22は画面位置検出回路23によって制御される。この様にして検出される複数箇所の温度のなかから重み係数 $\alpha$ の制御データとして最適のものを用いる。同様の変形は、先の図15の実施例

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に対しても行うことができる。

【0043】なお、液晶表示部の4角の温度データをそのまま用いるのではなく、例えば図17に示すような基準となる温度ムラパターンを用意しておいて、端 $x_e$ の温度が $CT0$ になったら、距離 $x1$ での温度を $CT1$ にするという予測を行うようにすることも有効である。

【0044】図18は、図12の実施例に対して更に、画像信号入力部に雑音除去フィルタ24を設けた実施例である。先に説明したように入力信号に雑音があると、誤検出によって雑音を増幅してしまう可能性がある。この実施例のように雑音除去フィルタ24を設けることによって、誤検出を少なくすることができる。この雑音除去が有効に働くならば、動き検出回路8を省略することもできる。先に説明した図1、図4、図8の実施例に対しても同様に雑音除去フィルタを入力端子部に設けることは有効である。

【0045】

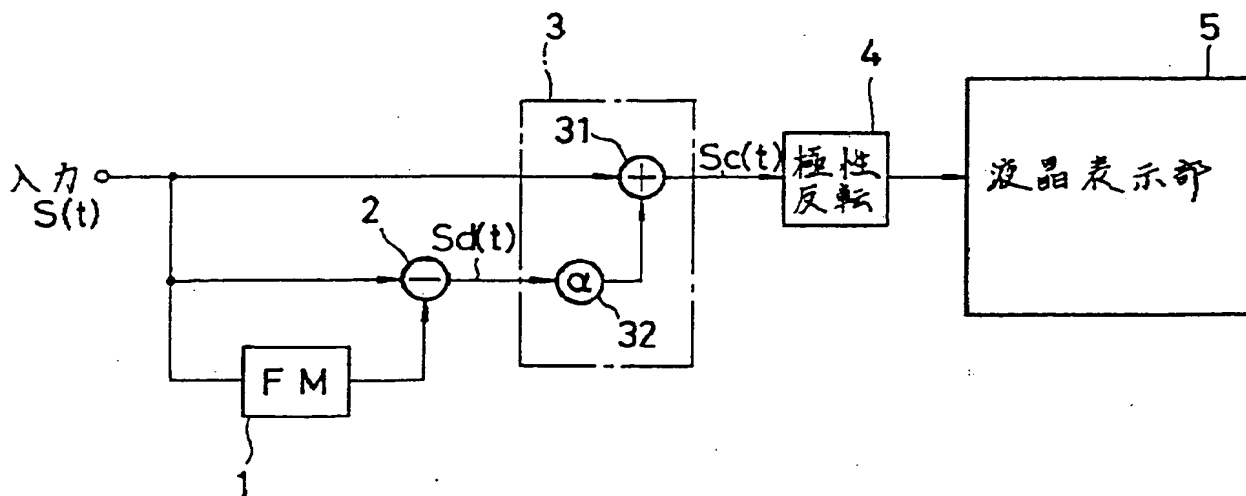
【発明の効果】以上詳細に説明したように本発明によれば、時間軸フィルタを用いて入力画像信号の高域強調を行うことにより、液晶表示装置の応答特性を改善し、特に中間調表示での応答速度を高速化して、残像を低減した高画質の液晶TVを実現することができる。

【図面の簡単な説明】

- 【図1】本発明の第1の実施例の要部構成を示す図。  
 【図2】同実施例の動作を説明するための信号波形図。  
 【図3】同実施例の高域強調フィルタの特性を示す図。  
 【図4】第2の実施例の要部構成を示す図。  
 【図5】同実施例の動作を説明するための信号波形図。  
 【図6】本発明の第3の実施例の要部構成を示す図。  
 【図7】本発明の第4の実施例の要部構成を示す図。

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【図1】



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【図8】本発明の第5の実施例の要部構成を示す図。

【図9】液晶の応答速度の温度依存性を示す図。

【図10】液晶の物性定数の温度依存性を示す図。

【図11】液晶の温度検出器の構成例を示す図。

【図12】動き検出回路を備えた実施例の要部構成を示す図。

【図13】同実施例の動き検出回路の構成例を示す図。

【図14】動き量と高域強調量の関係を示す図。

【図15】図12の実施例に温度検出器を設けた実施例の要部構成を示す図。

【図16】図15を変形して複数箇所の温度検出を行うようにした実施例を示す図。

【図17】温度制御のための基準温度分布を示す図。

【図18】雑音除去フィルタを設けた実施例の要部構成を示す図。

【図19】液晶の応答速度を説明するための図。

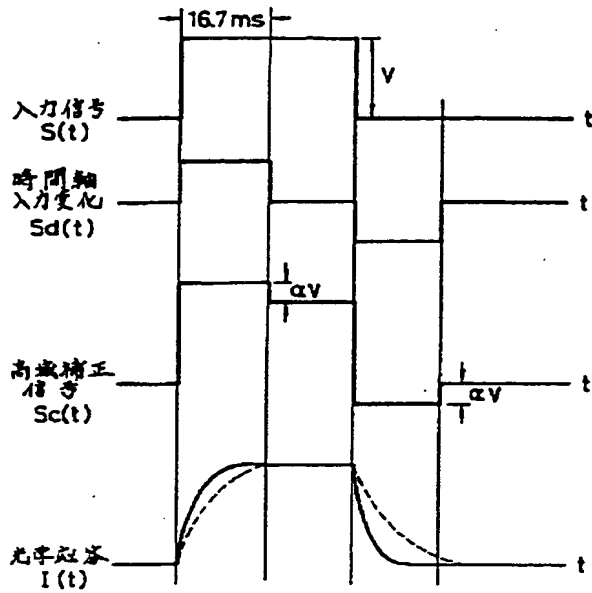
【図20】液晶の透過率の入力電圧依存性を示す図。

【符号の説明】

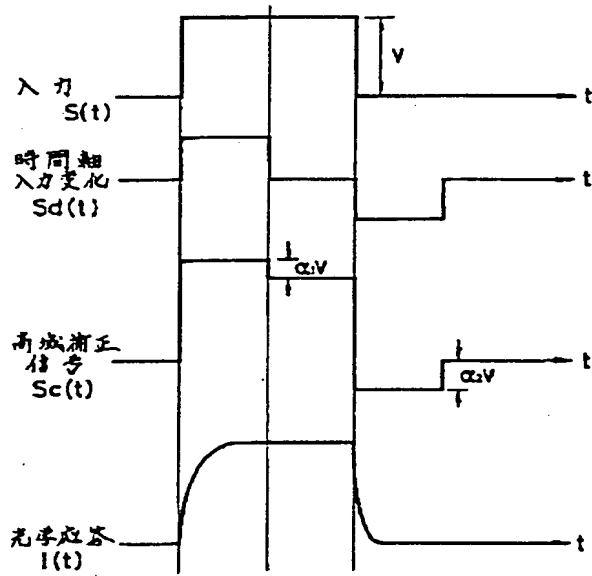
- 1…画像用記憶回路、  
 2…差分器（レベル変化検出回路）、  
 3…時間軸フィルタ回路、  
 31…加算器、  
 32…重み付け回路、  
 33…切替え回路、  
 4…極性反転回路、  
 5…液晶表示部、  
 6…温度検出器、  
 7…順次走査変換回路、  
 8…動き検出回路。



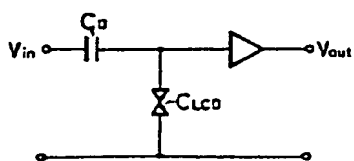
【圖2】



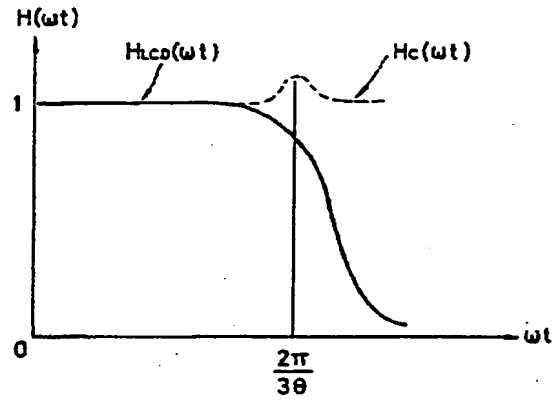
【圖5】



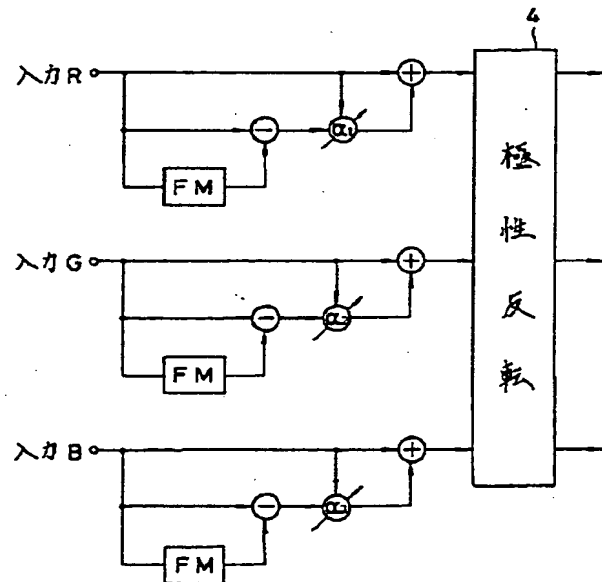
【圖11】



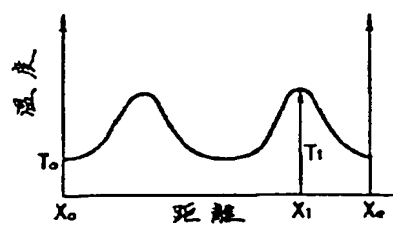
【圖3】



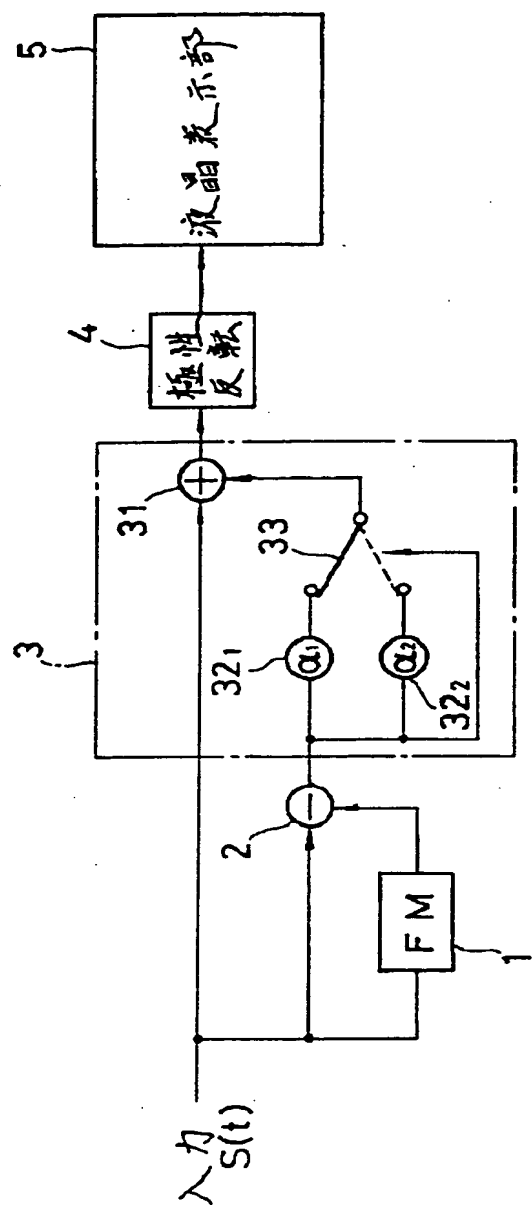
【圖7】



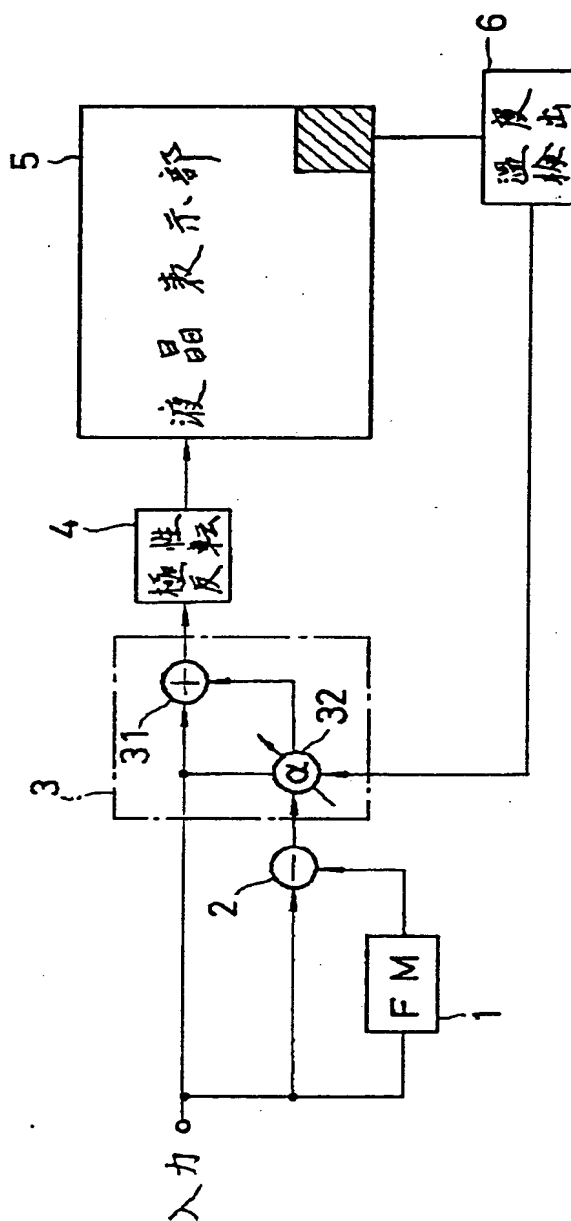
【圖17】



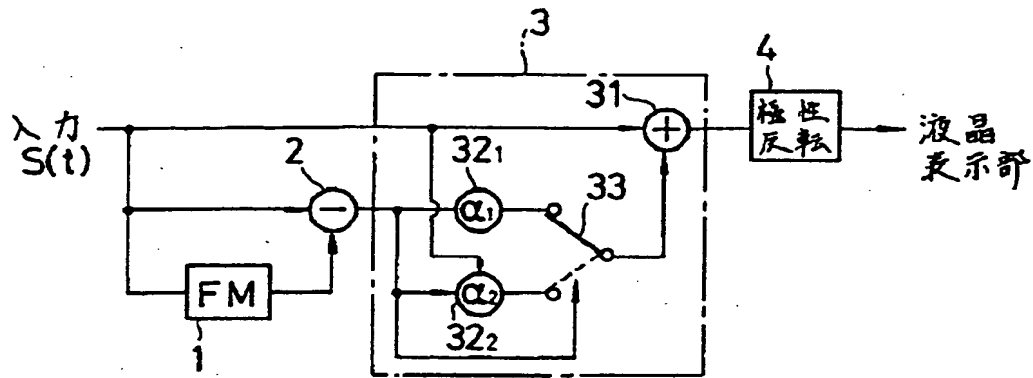
【図4】



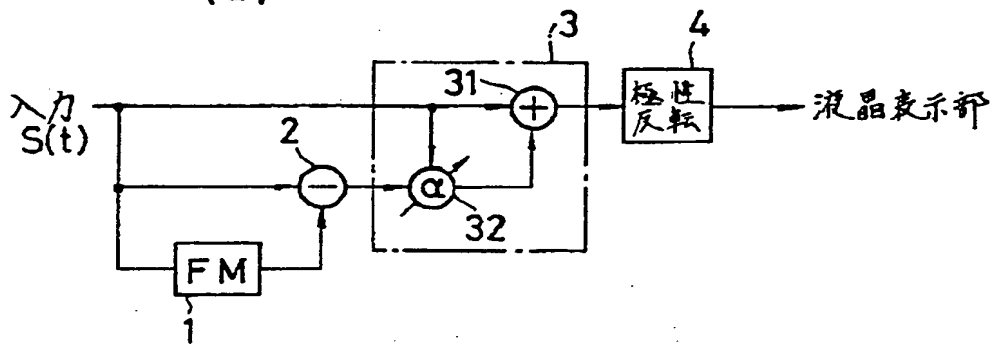
【図8】



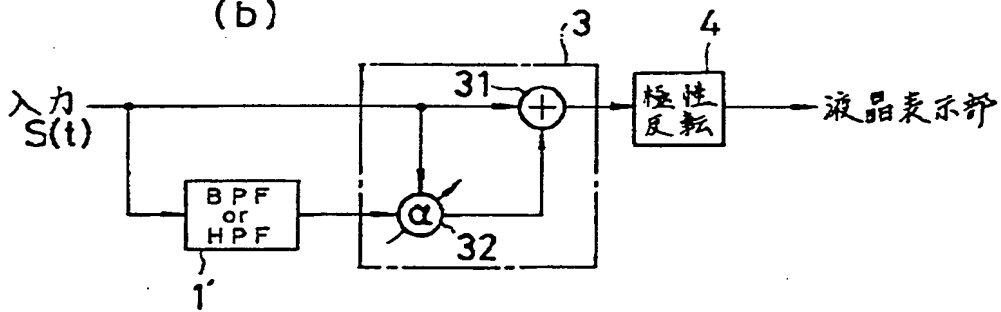
【図6】



(a)

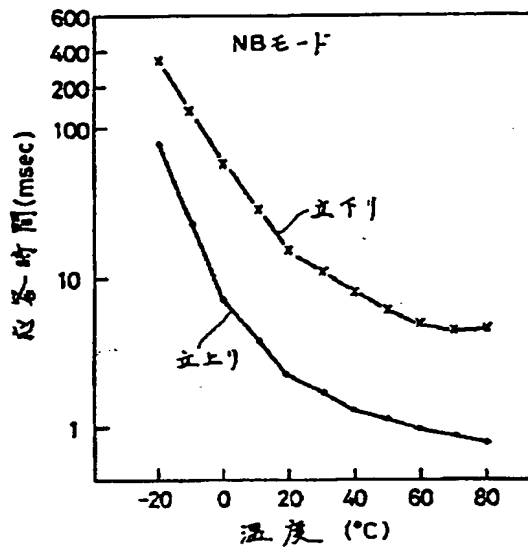


(b)

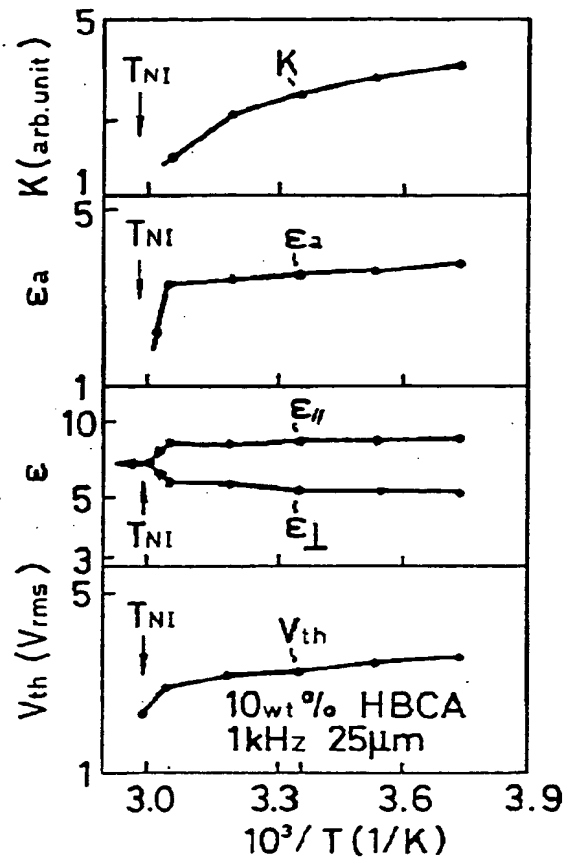


(c)

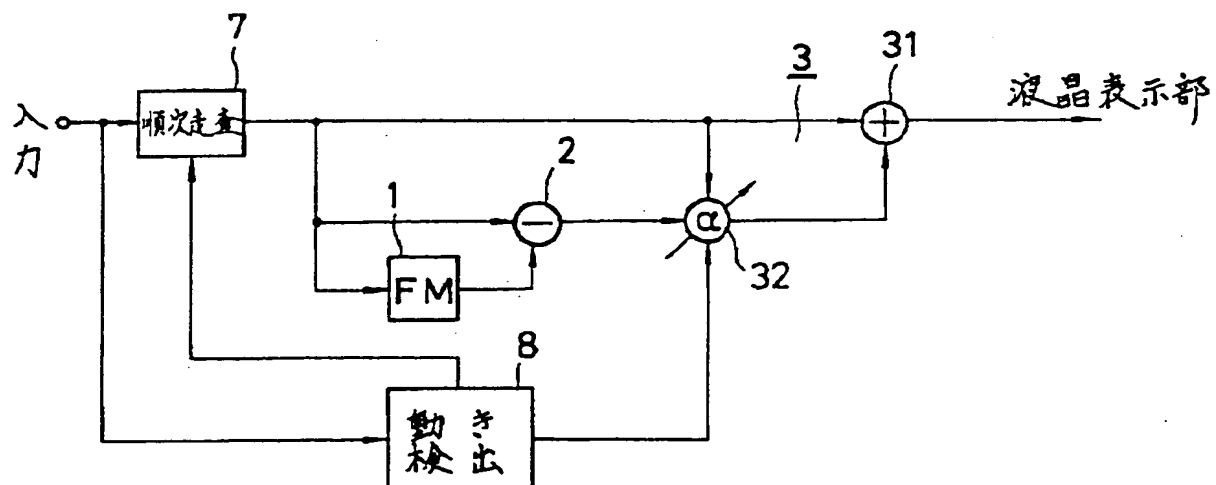
【図9】



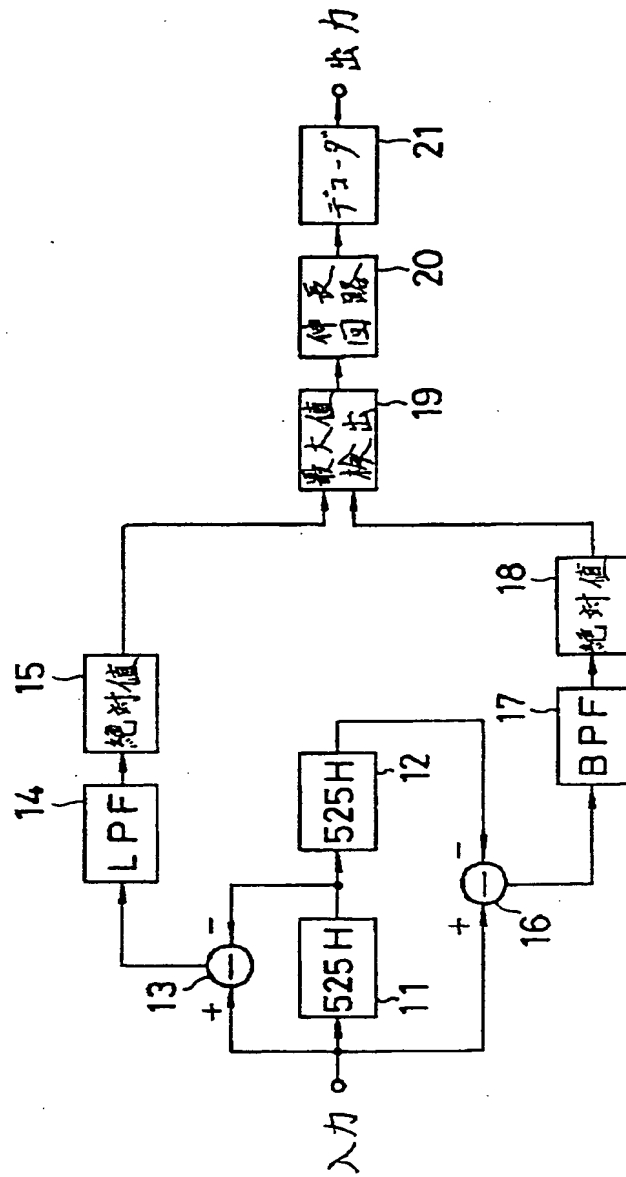
【図10】



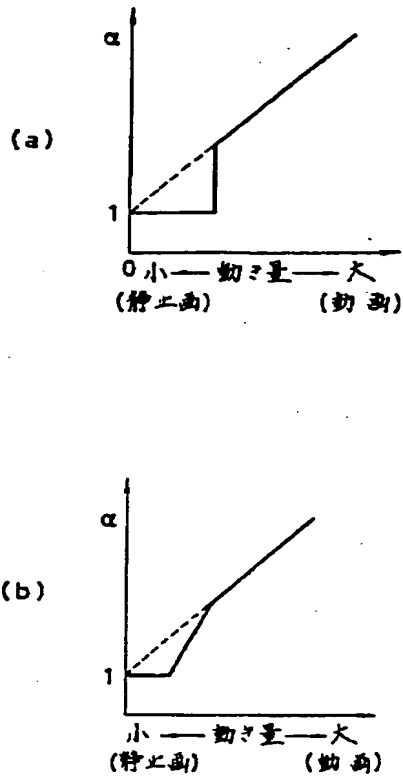
【図12】



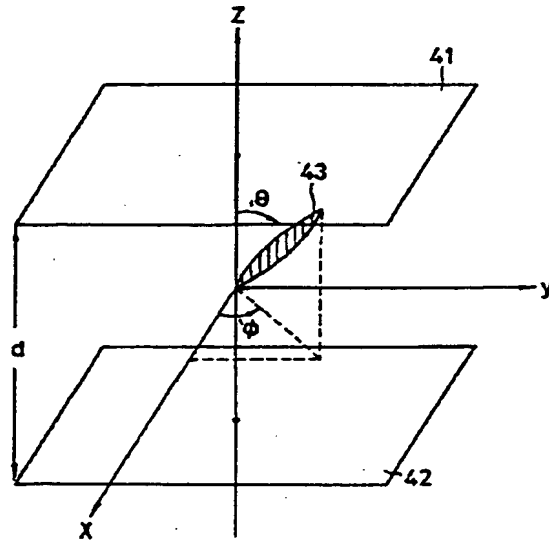
【図13】



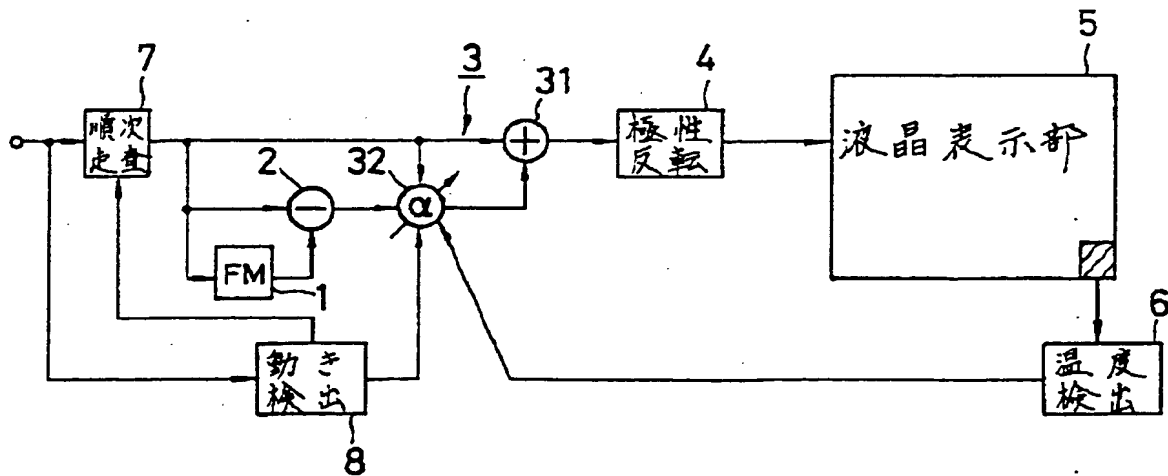
【図14】



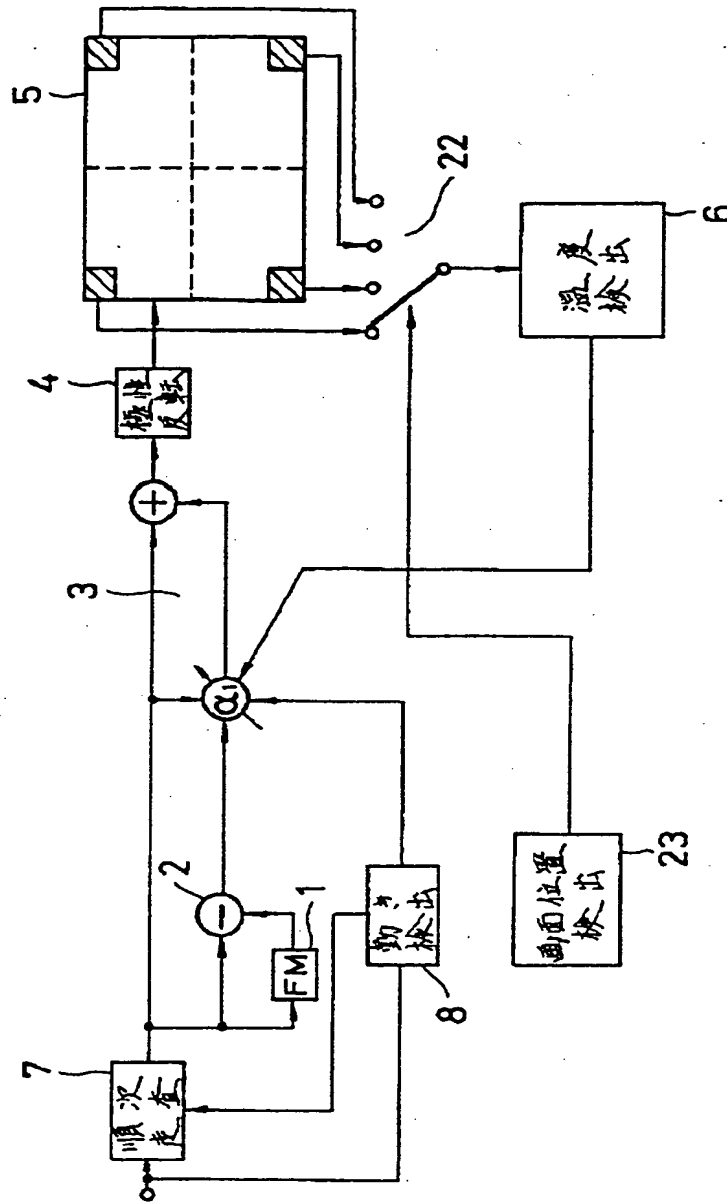
【図19】



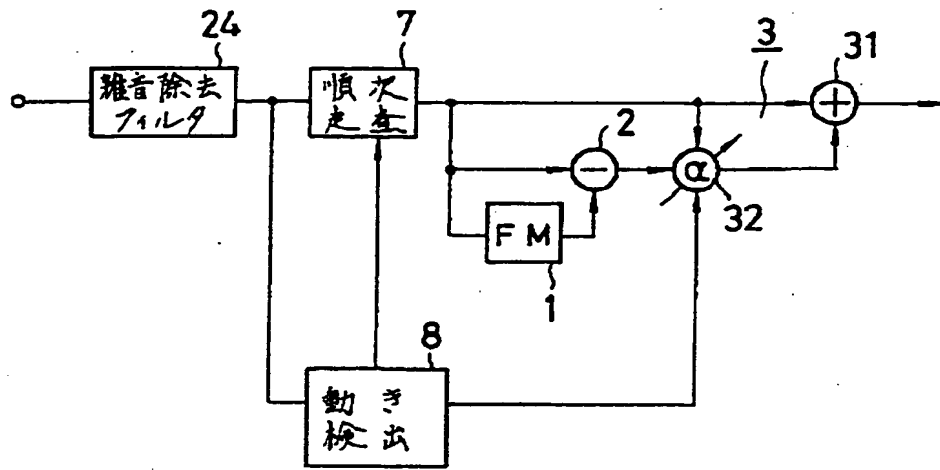
【図15】



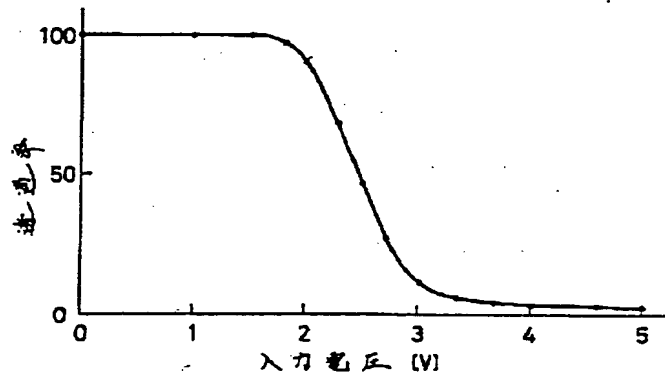
【図16】



【図18】



【図20】





DEC/OAT 55750 (45672)



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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/820,021	03/28/2001	Takako Adachi	55,750 (45672)	5288

21874 7590 06/18/2003

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P.O. BOX 9169  
BOSTON, MA 02209

EXAMINER

ZAMANI, ALI A

ART UNIT	PAPER NUMBER
----------	--------------

2674

DATE MAILED: 06/18/2003

5

Please find below and/or attached an Office communication concerning this application or proceeding.

COPY

107

**Notice of Abandonment**

Application No.

09/820,021

Examiner

Ali A. Zamani

Applicant(s)

ADACHI ET AL.

Art Unit

2674

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

This application is abandoned in view of:

1. ☒ Applicant's failure to timely file a proper reply to the Office letter mailed on 20 November 2002.
  - (a) ☐ A reply was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply (including a total extension of time of \_\_\_\_\_ month(s)) which expired on \_\_\_\_\_.
  - (b) ☐ A proposed reply was received on \_\_\_\_\_, but it does not constitute a proper reply under 37 CFR 1.113 (a) to the final rejection.  
(A proper reply under 37 CFR 1.113 to a final rejection consists only of: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114).
  - (c) ☐ A reply was received on \_\_\_\_\_ but it does not constitute a proper reply, or a bona fide attempt at a proper reply, to the non-final rejection. See 37 CFR 1.85(a) and 1.111. (See explanation in box 7 below).
  - (d) ☒ No reply has been received.
2. ☐ Applicant's failure to timely pay the required issue fee and publication fee, if applicable, within the statutory period of three months from the mailing date of the Notice of Allowance (PTOL-85).
  - (a) ☐ The issue fee and publication fee, if applicable, was received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the statutory period for payment of the issue fee (and publication fee) set in the Notice of Allowance (PTOL-85).
  - (b) ☐ The submitted fee of \$\_\_\_\_\_ is insufficient. A balance of \$\_\_\_\_\_ is due.  
The issue fee required by 37 CFR 1.18 is \$\_\_\_\_\_. The publication fee, if required by 37 CFR 1.18(d), is \$\_\_\_\_\_.
  - (c) ☐ The issue fee and publication fee, if applicable, has not been received.
3. ☐ Applicant's failure to timely file corrected drawings as required by, and within the three-month period set in, the Notice of Allowability (PTO-37).
  - (a) ☐ Proposed corrected drawings were received on \_\_\_\_\_ (with a Certificate of Mailing or Transmission dated \_\_\_\_\_), which is after the expiration of the period for reply.
  - (b) ☐ No corrected drawings have been received.
4. ☐ The letter of express abandonment which is signed by the attorney or agent of record, the assignee of the entire interest, or all of the applicants.
5. ☐ The letter of express abandonment which is signed by an attorney or agent (acting in a representative capacity under 37 CFR 1.34(a)) upon the filing of a continuing application.
6. ☐ The decision by the Board of Patent Appeals and Interference rendered on \_\_\_\_\_ and because the period for seeking court review of the decision has expired and there are no allowed claims.
7. ☐ The reason(s) below:

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SUPPORTING DOCUMENTS  
DATE: 11/21/2002

Petitions to revive under 37 CFR 1.137(a) or (b), or requests to withdraw the holding of abandonment under 37 CFR 1.181, should be promptly filed to minimize any negative effects on patent term.

<b>Interview Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/820,021		ADACHI ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Ali A. Zamani		2674	

All participants (applicant, applicant's representative, PTO personnel):

- (1) Ali A. Zamani. (3) \_\_\_\_\_.
- (2) Davidid Collins & David A. Tucker. (4) \_\_\_\_\_.

Date of Interview: 10 June 2003.

Type: a) ☒ Telephonic b) ☐ Video Conference  
 c) ☐ Personal [copy given to: 1) ☐ applicant 2) ☐ applicant's representative]

Exhibit shown or demonstration conducted: d) ☐ Yes e) ☐ No.  
 If Yes, brief description: None.

Claim(s) discussed: None.

Identification of prior art discussed: None.

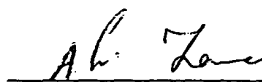
Agreement with respect to the claims f) ☐ was reached. g) ☐ was not reached. h) ☒ N/A.

Substance of Interview including description of the general nature of what was agreed to if an agreement was reached, or any other comments: Examiner indicated that the case is abandoned.

(A fuller description, if necessary, and a copy of the amendments which the examiner agreed would render the claims allowable, if available, must be attached. Also, where no copy of the amendments that would render the claims allowable is available, a summary thereof must be attached.)

THE FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW. See Summary of Record of Interview requirements on reverse side or on attached sheet.

Examiner Note: You must sign this form unless it is an Attachment to a signed Office action.

  
 \_\_\_\_\_  
 Examiner's signature, if required

**COPY**

**NOTICE OF ABANDONMENT**

COPY



## EDWARDS & ANGELL, LLP

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*since 1894*

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December 5, 2002

United States Patent and Trademark Office  
Electronic Business Center  
2231 Crystal Drive; Suite 903  
Arlington, VA 22202

Dear Mr. Uranga:

Enclosed please find printed and disk copies of a spreadsheet detailing patent applications and issued patents which we would like to have connected to our customer number, 21874.

Please contact this office should you have any questions. Thank you for your attention in this regard.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. G. Conlin', written over a horizontal line.

David G. Conlin

Enclosures

### Customer Number Submission

Please see highlighted case on marked page of attachment.

COPY

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February 11, 2003

Mr. Tony Uranga  
United States Patent and Trademark Office  
Electronic Business Center  
2231 Crystal Drive; Suite 903  
Arlington, VA 22202

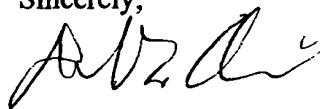
Re: Customer number 21874

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Sincerely,



David G. Conlin

Enclosures